JULY 10, 1922

THE RUBBER AGE

VOL. XI. NO. 7

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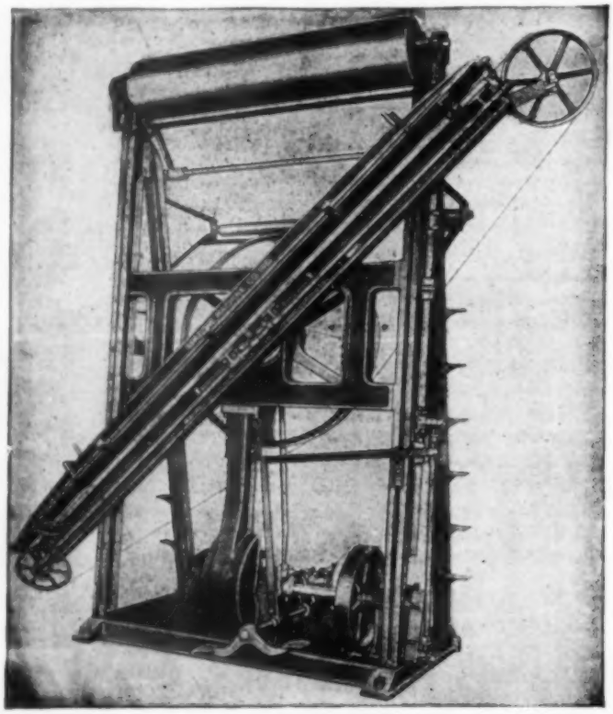

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VOL. XI JULY 10, 1922 No. 7

The Rubber Footwear Industry

The Principal Firms in the United States Engaged in This, One of the Oldest and most Important Branches of the Greater Industry, now Number Twenty-One

THE manufacture of rubber footwear is one of the oldest industries of the craft. Charles Goodyear himself, shortly after he made the discovery of vulcanization in 1839, fashioned gum shoes in his little shop. In 1842, three years after Goodyear's discovery, the L. Candee factory was started in New Haven. In this factory Goodyear had a laboratory where he continued his experiments, and developed a number of new methods and ideas.

Leading Industry for Years

For years the manufacture of footwear was the leading rubber industry in this country, until the introduction of the automobile gave impetus to the tire industry. According to the rubber questionnaire of the Rubber Association for 1921, the volume of shipments of boots and shoes was $91,086,200 as against $506,460,740 for the tire industry, not quite 20 per cent of the latter. The earning capacity of the shoe business proved so alluring that several tire manufacturers made preparations to enter the field during the recent period of depression.

There are at present twenty-one concerns in the United States engaged in the manufacture of rubber footwear. Among the best known plants are the following: American Rubber Co., Cambridge, Mass.; Beacon Falls Rubber Shoe Company, Beacon Falls, Conn. and College Point, L. I.; Boston Rubber Shoe Company, Malden and Melrose, Mass.; Bourne Rubber Company, Providence, R. I.; Cambridge Rubber Company, Cambridge, Mass.; L. Candee Rubber Company, New Haven, Conn.; Converse Rubber Shoe Company, Malden, Mass.; Goodyear Metallic Rubber Company, Naugatuck, Conn.; Goodyear's India Rubber Glove Mfg. Company, Naugatuck, Conn.; Goodyear Rubber Company, Middletown, Conn.; Firestone-Apsley Rubber Company, Hudson, Mass.; B. F. Goodrich Rubber Company, Akron, Ohio; Hood Rubber Company, Watertown, Mass.; LaCrosse Rubber Company, LaCrosse, Wisconsin; Lambertville Rubber Company, Lambertville, N. J.; Lycoming Rubber Company, Lycoming, Pa.; Meyer Rubber Company, New Brunswick, N. J.; Millville Rubber Company, Millville, Mass.; Mishawaka Woolen Manufacturing Company, Mishawaka, Ind.; National India Rubber Company, Bristol, R. I.; Woonsocket Rubber Company (Alice Mill), Woonsocket, R. I.

New England is Still Important Center

Thus it can be seen that New England is still pre-eminent in this industry and is destined to remain so owing to the proximity to the markets for the product and the skilled labor supply, which includes generations of craftsmen.

The importance of skilled labor can be realized when it is known that the labor cost of rubber footwear is 25 per cent of the selling price whereas in the tire industry it does not exceed 10 per cent. Despite the vast progress made in this country in the displacing of hand labor by machinery, there are still a large number of processes in the making of boots and shoes which require the dexterity and skill of the human hand.

Although in many ways footwear manufacturing does not require the close inspection and adherence to microscopic measurements of the tire industry, it presents vastly greater problems in the field of routing and controlling the work in the plant. Furthermore there are many more chances for serious errors in manufacture. In a plant producing 20,000 pairs per day which is an average production, there are a million and a half separate pieces or parts in process at any one time which will give an idea of the difficulties of control.

The preliminary processes such as the washing and breaking down of rubber, compounding, mixing, and calendering are accomplished in the same manner as in allied industries, the types of calenders used being known as upper and sole calenders, equipped with changeable rolls for embossing the

SEAMING THE FOXING BEFORE PUTTING THE OUTSOLE ON A TENNIS SHOE

imprint of the bind, corrugation, and manufacturer's brand, and lining and friction calenders for coating and frictioning the fabrics which form a carcass or structure of the finished article.

Compounding is Done Carefully

Shoe compounding is almost an art in itself and calls for a larger amount of experimentation and resourcefulness than tire compounding. This can be realized when one considers that a dozen compounds will suffice for a tire whereas a plant manufacturing the full line of footwear calls for two or three times this number. The shoe chemist has a wider range of rubbers at his disposal and can utilize reclaim to a better ad-

vantage. In the production of a non-molded article like the rubber shoe the problem of shrinkage prevents the use of compounds with a high crude content no matter what the price of the raw material is. In the early days black was the prevailing color, but this has long since been partly replaced by the demand for white, red, and other shades of compounds.

Litharge is the commonest inorganic accelerator used and is employed widely for this purpose in such compounds as black uppers, black and red soles, frictions and coatings. Lime serves the same purpose in white compounds but cannot be employed in as large quantities as litharge as it has a tendency to make compounds hard and brittle upon ageing. White compounds are usually more heavily loaded with sulphur to effect the proper cure, sulphur bloom being no detriment to their appearance. Organic accelerators are used sparingly in high-grade whites in the pressure and steam cure.

Whiting, barytes, and china clay are standard footwear fillers, English whiting gives the best results in uppers and the better grade stocks, while the American or limestone whiting works in very well in the cheaper rag compounds where its quick aging properties are no disadvantage. Barytes gives the compound good stretch and elasticity, and china clay generally makes footwear compounds harsh in comparison to whiting.

Carbon-black, lampblack, lithopone, red oxide, and zinc oxide are the coloring agents for footwear and are used in small quantities for this purpose. M.R., resin, coal tar, and pine tar impart softness which is especially desired in frictions, coatings, and cheaper compounds to make them mill up and calender better.

Many Fabrics Used

Fabrics of all kinds, both cotton and woolen, find a wide use in footear. Sheetings, and osnaburgs of various weights, when frictioned and coated, form integral parts of the product for reinforcing on the inside such as leg and vamp forms in boots, heel pieces in gum shoes, and insoling. Stockinette, gummed, cut, and dyed in various shades, makes the linings, and jersey, containing a high percentage of wool which makes it one of the most expensive fabrics in the line, forms the outside of light-weight gaiters and arctics. Better grades of duck, jeans, and drill are employed in tennis shoes for the uppers and linings. The volume of this class of material used is so large that many cotton and woolen mills make a specialty of producing goods for the rubber footwear manufacturers.

PLACING RUBBER FOXING ON THE 4-BICLE OVERSHOE

For many years the only type of vulcanization known was the dry or air cure whereby the cars of shoes were run into an air-tight chamber, lined with steam coils and cured by a dry heat to about 260 degrees Fahrenheit over a period of 6 or 7 hours. About 1910 the steam cure was introduced by which the shoes were built on hollow metal lasts instead of wood and cured from the inside by the introduction of steam on the inside of the last as well as live steam in the vat. This shortened the cure to about 2½ to 3 hours but was only adaptable to goods of the rough and heavy type such as boots, all-rubber artics, and lumberman's. This cure also had a weakening effect on the fabrics subjected to it. It is still in use and gives excellent results for certain classes of work, but is now being generally superseded by the pressure cure, which uses the same type of equipment but effects the cure by air pressure and a vacuum which eliminates blisters and unites the parts of the shoe in one homogeneous piece.

Control of rubber footwear production is generally centralized in a production planning department. Here the orders are received, analyzed, and the necessary instructions issued to the mill for making the shoes. The usual method is to issue a master ticket, scheduling a definite production of certain sizes, styles, and grades about a week in advance of the making date. This allows each department to work on day's unit of production, from the mixing of the rubber, through the milling, calendering, cutting, cementing and stitching, to the making or building of the shoes, curing, stripping, and packing.

The Cutting Department

The work of the cutting department is divided into upper cutting, block cutting, sole cutting, generally grouped under the name of gum cutting, and fabric cutting. The sheets of upper stock are taken from the calender on frames and placed in the alleys in front of the cutter's benches. The top of the cutter's table is a zinc plate set at an angle of about 40 degrees, with a roller on the outside edge over which he pulls the sheets of stock on to the plate for cutting. All uppers are cut by hand with a knife ground down about 1½ inches, but only ½ inch is kept sharp. The cutters use what is known as the "front hand" stroke which consists of holding the knife between the thumb and index finger, starting at the left hand side of the binding edge and finishing at the bottom right hand corner with a sweeping stroke. In the same manner the inside of the upper is cut round at the edge of the binding which is imprinted in the rubber by the engraved roll of the calender. As fast as the uppers are cut they are placed in books of five or six cloth leaves mounted on a frame to be sent to the makers. A steady upper cutter can cut a ticket of 800 pairs in an ordinary working day, and owing to the tacky and sticky nature of the gum upper, it is doubtful if any machine could be devised to supercede this time-honored method of cutting one piece at a time by hand.

Another branch of gum cutting is block cutting with a handle die. Gum toe caps, toe and heel foxings, boot counters, vamps, shinnies, and inner vamps are cut by this method. The wooden block is kept moist, and the stock is wiped with a damp cloth as the parts are cut by a series of fast strokes of the mallet on the die. When not in use the dies are kept in a tray filled with water. In this form of cutting it takes longer to pick up and book the parts after they are cut than the actual cutting, so that the piece worker has to be equally skilled in booking.

Outsoles, which are cut both by machine and the hand method, must also be cut one piece at a time owing to the bevel edge which is necessary in the making process to allow the sole to be rolled at the edge and fit snugly against the foxing. The Wellman outsole machine is best adapted to large brackets of work where there are very few changes of patterns, for on a varied ticket, the hand cutters can compete with the machine. On the machine, the operator adjusts the pattern in place, feeds the sheets of soling stock under it so that the trademark or medallion is centered, presses a foot pedal which simultaneously lowers the pattern and propels the knife round the beveled edge of the pattern cutting out the sole. Each machine is supplied with a helper who picks and books the soles as they are cut. Three thousand pairs per day is a good ticket for a Wellman operator.

The Work of Cutting Outsoles

The outsole cutter uses the back hand stroke which calls for a great deal of strength in the wrist. The knife must be gripped firmly in order to cut the soles with the proper bevel, with the thumb on top of the handle and the first knuckle joints toward the operator. The first stroke begins on the

opposite side of the pattern and is made away from the cutter. This stroke goes round the toe to the shank on the right side when the cut is completed. The soles are then picked out, booked, and the scrap placed in bins to be carted back to the calender department for re-running.

The fabric cutting section of the cutting department calls for close attention to detail and workmanship owing to the large number of pieces handled and the high cost of the material. From the calender and drying rooms, the rolls of fabric, some frictioned, some coated, and some a combination of both processes are sent to the cutting dept. The next process is laying off the stock in table lengths, plied up from 16 to 40 thicknesses for cutting. A device known as the doubling drum by which the fabrics are wound on a revolving drum about 20 feet in circumference and cut off to form the desired number of plies is in general use. The various parts are stamped out by dies on a beam press, although some patterns not used extensively are cut out by the hand method which consists of cutting round the tin patterns with a sharp-pointed knife. The electric knife for cutting out parts of oblong or square shape is also used. The placing of the dies so that they cut to the best advantage calls for considerable attention and skill, and these operators are usually paid on some sort of bonus plan according to the amount of stock they save.

After the various parts are cut, marked for sizes, and counted, they are sent on their way to the making departments. Most of them must have further preparation, however, such as cementing, rolling together, stitching of tennis uppers, which work is segregated in one or two departments for this purpose.

New and Old Operations Compared

In the old days, the rubber shoe makers performed all of the operations of the building or making of the shoe from lasting over the lining to the insole to rolling on the outsole, and even to stripping the shoes from the lasts after vulcanization. To-day, the separate operations have been so divided up that the finished article is the product of five or six different hands, each one of whom has performed a special operation upon it. This introduction of team-work in making has been a means of increasing production on the theory that a worker can do more and better work when her efforts are confined to one or two operations than when they are dispersed among many.

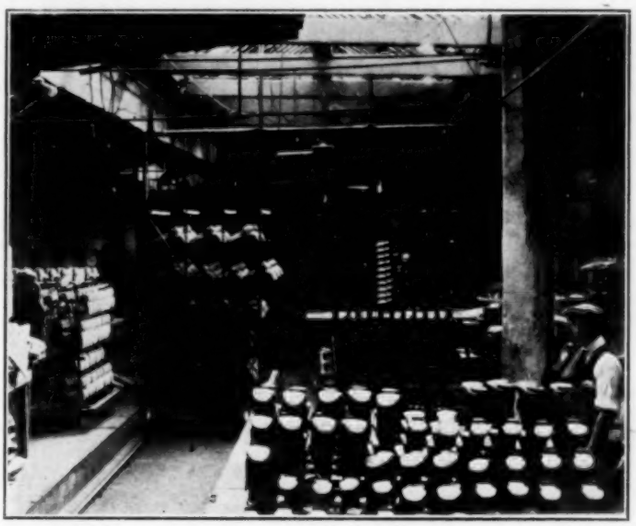
The operators in the making departments consist of both men and women, the men makers being employed on boots, heavy arctics, lumbermen's and certain grades of tennis while the women are more skilled in making gaiters or overshoes, gum shoes, and lighter grades of tennis. It is in the making departments where the largest amount of hand labor still finds employment in the rubber shoe industry, and it is only recently that machines of any sort have been introduced. These are sole pressing machines for pressing on the outsole by means of compressed air, manual of water pressure, but these machines neither stitch the edge of the sole nor place it in position, so that the only real saving is the insurance that the sole is put on to stay, and the old danger of loose outsoles from careless hand rolling is eliminated.

"Niggerhead" or consolidated hand-lasting machines, of the same variety used to last leather shoes, are now employed to last tennis shoes of the heavier grades, but no machines have been developed for handling gum or rubber shoes.

The recent death of Henry J. Doughty, recalls his attempt in 1886 to introduce machines for a molded rubber shoe. The well-known "Marvel" shoe of the Marvel Rubber Company, Woonsocket, R. I. afterwards absorbed by the United States Rubber Company, was put on the market, but it could not compete with the last-built shoe owing to the cost of operation.

Products Find Wide Distribution

The wide and varied uses of rubber footwear have been developed to such an extent that the products of American factories are sold to persons in all walks of life and in every conceivable occupation. Thus the rubber boot finds favor with the sea-coast fisherman as well as his aristocratic brother who angles for trout in the streams and lakes of Maine; the automobilist finds a pair indispensable when washing his car; city laborers, mill workers, firemen and policemen, have styles built suitable for them. Lumbermen in the woods of Maine and explorers in the Yukon have shoes built especially for their use. Farmers, miners, workers in creameries, and ice cream plants furnish a demand for rubber pacs, and all rubber overshoes. Light jersey gaiters for women have found favor with the "flappers", and light rubbers are a staple in every community. Heavy serviceable rubbers for postmen, policemen, and teamsters have their place in the line. The



VARIETIES OF FOOTWEAR BEING PLACED IN DRY AND PRESSURE VULCANIZERS

tennis shoe or "sneaker" finds a sale by the thousands at the beach and summer resorts, and gymnasiums, Y. M. C. A.'s, college and preparatory school basketball teams furnish a winter demand for certain types of rubber-soled shoes which have been developed by resourceful rubber shoe designers.

Whereas rain, snow, and slush were the only business accelerators for the old-time rubber shoe companies, the extended line of the factories of to-day furnishes a steady demand in all kinds of weather, although severe stretches of winter weather make an extra demand which always means maximum production.

Gas Masks for Crude Oil Vapors

The Bureau of Mines usually recommends the hose mask for protection against vapors of crude oil. This consists of a Tissot type face-piece that allows breathing through the nose, attached to a non-collapsible rubber hose extending to pure air. Such a mask is very useful in tanks where distances from fresh air are short, but would have limited service in mines. A man can breathe through 100 to 125 feet of hose without undue exertion; with longer lengths it is necessary to force the air to him. Gas masks of the army type having canisters filled with activated charcoal give protection for short periods of time, 5 to 10 minutes, against oil vapors not exceeding 1 or 2 per cent in air. The gas mask is essentially a filter for air containing small admixtures of irrespirable gases, but otherwise normal. Unless it is positively known that the concentrations of vapors do not exceed 2 per cent, gas masks must not be used. Self-contained oxygen breathing apparatus having bags of thin rubberized fabric may be used for periods up to 10 minutes in high concentrations of vapors, but thereafter gasoline and petroleum vapors penetrate the rubber. Breathing apparatus made with heavy rubber breathing bags 1/16 inch or more in thickness may be used for periods up to 2 hours. After use, the breathing bags should be aired in fresh air for at least 6 hours to rid them of absorbed vapors before further use. The Bureau of Mines is now developing breathing apparatus in which the bag consists of a material impervious to petroleum vapors

ABSTRACTS

Technical — General — Commercial

Rubber Waterproofing Process

In British Patent No. 177,566, which is assigned to S. J. Peachey, there is described a process of waterproofing various fabrics by the aid of rubber. Textile fabrics, paper, leather, rubber, wood, metal or stone may be waterproofed by the application of a covering of vulcanized rubber gel or of a mixture of solutions capable of yielding such gels.

Rubber Like Substances

The H. O. Traun Forschungslaboratorium G.m.b.H. has patented a process for making rubber-like substances by the polymerization of various hydrocarbons. Butadiene, isoprene or dimethyl-butadiene is polymerized in the presence of acrolein-methylamine or an analagous compound which contains a conjugated pair of double bonds in the molecule. The latter undergoes con-current polymerization. The product that is obtained in this manner resembles natural rubber to a considerable extent, and can be easily vulcanized. See British Patent No. 156,118.

Sulphuric Acid and Rubber

The action of sulphuric acid in concentrated form on rubber dissolved in organic solvents, such as benzene, carbon disulphide, carbon tetrachloride, etc., is chiefly chemical, whereby the hydrocarbons undergo a change in composition as well as a change in physical properties and structure. The elasticity, plasticity, solubility and specific gravity of the rubber are altered. From the results of the investigation, a new interpretation of the oxidation processes of vulcanized rubber is indicated. The hard brittle mass obtained is the oxidation product of tetramethylene-caoutchouc obtained by the transformation of caoutchouc. Kolloid Zeitschrift, 1922, 30, pages 176 to 186.

Recovering Rubber

French Patent No. 532,450, which is concerned with a process of recovering rubber, has been assigned to the Societe Anonyme des Pneumatiques Dunlop. The process of recovering rubber from rubber tires that is described in this patent consists in dissolving the rubber in a liquid which boils at a temperature above 100 deg. C. The fibers are separated and the liquid filtered or centrifuged. Sulphur and a vulcanization accelerator, such as piperidine, thiocarbanalide, etc., are added to the solution and the mixture is heated. The precipitate that is formed is separated, washed and dried. The product obtained in this way can be used for making various rubber articles. The solvents used are various hydrocarbons, xylol, naphthalene, phenols, thymol, cresol, or their ethers, eugenol, phenetol, amines, aniline, toluidine, nitro and halogen derivative of these compounds, nitrobenzol, oils, mineral oils, etc.

Recovering Waste Rubber

This process is applicable to waste rubber which has not been very highly vulcanized. The process takes place in a colloid mill where the waste rubber is very thoroughly disintegrated. The process is carried out in the presence of water together with small quantities of soaps or colloids such as glue, casein, etc. Swelling agents such as benzene, toluene oxylene are also present. The removal of the sulphur, which is combined with the rubber or else contained in the free condition in the rubber mass, is facilitated by the addition of compounds of an alkaline nature, such as the mineral alkalies, ammonia and organic amines. A liquid mixture is obtained in this manner, and the rubber is therein contained in a colloidal condition much the same as in natural rubber latex. Vulcanization of the rubber can be accomplished very readily after the colloid has been coagulated in the same manner as in the treatment of natural rubber latex. The sulphur, which combines with the mineral alkalies, may be removed or is left in the rubber and used in the subsequent vulcanization. See British Patent No. 156,150.

Rubber Treating Machine

French Patent No. 520,335 is concerned with a machine for treating rubber and other heavy plastic compositions. The invention consists in the utilization of a special apparatus for the introduction of the rubber and other substances either in solid or in powdered form into the kneading machine. The latter is furnished with a long collar in which there is arranged a counter-weight. The powdered materials are introduced through a lateral opening which is provided in the neck of the kneading machine, and are then pushed forward when the counter-weight drops. On the other hand when the counter-weight has attained its maximum height, a part of the collar is reached which is larger in cross-section than the rest of the collar, and a current of air is permitted to enter the apparatus and sweep away the dust which has accumulated in this part of the apparatus.

Acceleration of Vulcanization

Not every substance that contains nitrogen possesses the power of accelerating the vulcanization of rubber. Gelatine belongs to this category, but when it is decomposed or hydrolyzed, it yields a product which contains amino acids and which has a marked accelerating action on rubber vulcanization. If the hydrolysis is affected by the aid of acids, then they must be neutralized first in order to liberate the amino groups. It is more advisable to carry out the hydrolysis in the presence of alkalies, then to treat the mixture with carbon dioxide gas. Carbonate of soda can be employed as well. While the addition of 20 per cent to the rubber mixture seems to impair the quality of the product, on the other hand the addition of the same quantity of the hydrolyzed protein has the effect of actually improving the quality of the finished product. This process of making a rubber accelerator from gelatine is patented in French Patent No. 520,330.

Vulcanizing India Rubber

In British Patent No. 177,493 there is described a method of vulcanizing india rubber by the use of accelerating agents. The accelerator consists of a substance which contains the radical $\begin{matrix} R\text{-}C\text{-}S\text{-}M. \\ \| \\ X \end{matrix}$ In this radical M represents the hydrogen or salt forming element. The substance may also contain the radical $\begin{matrix} S\text{-}C\text{-}R \\ | \\ X \end{matrix}$ or $\begin{matrix} C\text{-}R \\ | \\ S \end{matrix}$ in which X represents a bivalent element or radical and R represents an element, which must not be nitrogen unless M represents $\begin{matrix} C\text{-}R \\ | \\ X \end{matrix}$. When a compound is used in which M represents a metal, the metal may be zinc or mercury for vulcanizing at ordinary temperatures, or zinc mercury, lead, cadmium, copper, arsenic or manganese may be used at higher temperatures. Aliphatic amines may also be added within certain limits in order to accelerate the vulcanization. In one example, a mixture of rubber 100 parts, zinc oxide 10 parts, zinc butyl xanthogenate 4 parts, sulphur one part and toluidine two parts is used; a cement may be produced by the addition of benzol. When an accelerating agent is used in which M is one of the groups mentioned, the time of vulcanization is usually longer, but pre-vulcanization does not take place. Several examples are given.

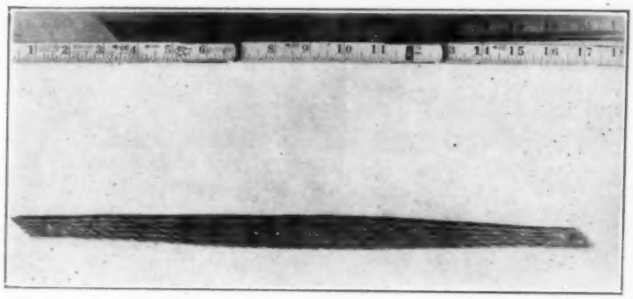
The Dickinson Automatic Cord Tire Making Machine

Tire Building Machine Now Being Manufactured Is Said to Eliminate Defects of Existing Types of Cord Tires and the Use of the Air Bag

By Arthur E. Friswell

IN an article which was published in *Tire Trade Journal* of March, 1922 I discussed briefly the fundamental differences between pneumatic tires of canvas and cord structure, and I tried to point out, not only the merits, but also the defects of both. A part of this article is reproduced herewith as an introduction to what follows:

"What is generally called the pneumatic tire is really that which *imprisons a pneumatic tire*—the outer casing or shoe. (The inner tube does not enter into this discussion). The thicker and stiffer the necessary imprisoning outer casing, the greater the departure from the real invisible confined pneumatic tire. As an extreme case air could be compressed into an annular iron tube, and this tube attached to a wheel, might be called a pneumatic tire, but no one would ever know it as such by its shock absorbing properties. It would not be a shock absorber; it would be a shocking monstrosity. At the other extreme, one could take a rubber inner tube and swathe it with enough mosquito netting so that air could be pumped into it, and attached to a wheel this could be termed a pneumatic tire, and it would be comfortably sweet to ride on but only for a moment. Then: biff, bang; gone. The



A Section of the Cord Unit

nearest approach to the ideal casing or shoe lies somewhere between these extremes. A good tough tread rubber and elastic tenacious rubber rivets (called the friction) to hold together the requisite plies of cotton are a "sine qua non," and may both be dismissed for later discussion, so that having settled upon cotton as the real restraining medium, it only remains to select the form in which the cotton shall be employed and applied.

The Use of Square Woven Cotton Canvas

"For a long time, what is known as square woven cotton canvas was generally used, cut on the bias, and each ply so laid as to be at right angles to the ply or plies immediately adjacent. Square weaving consists in securing approximately an equal breaking strain in either direction of warp and filling. (A very valuable discovery of the weaver brought about by its necessity in a tire). A tire casing so made, if properly made (a good big if) gives an excellent account of itself in service. In fact, (prior to the use of cord fabric) it was probably the most remarkably durable article of cotton and rubber ever produced.

The Cord Fabric

"Then the cord fabric came along and sometimes beats it and sometimes does not for which there are various reasons, as follows: the inherent weakness of woven canvas in a tire is that in time the see-sawing action of the warp threads chafing against filler threads, or vice-versa generates heat and friction and consequent rupture, a blow-out. A cord fabric consists of warps of tightly twisted cotton cord, *temporarily* held in position by very light, weak, widely spaced filling threads, which are designed to break when the tire is in service, and simply serve the purpose of holding the warp threads side by side while the weaver weaves the web and winds it into a roll, while the rubber man passes it through a machine which impregnates it with rubber, while the man at the cutting machine cuts it on the bias, and while the tire builder lays it ply on ply on the iron core, as the shoe builder shapes leather on a shoe-last.

"In service the filling threads break and the cotton cords (if properly laid and not overlapping, and *not* wavy, and not one tight and another loose and a few more ifs) becomes a series of spiral springs flexing under and beneath the tread and breaker and yielding more resiliently and spontaneously to bumps and jolts and jars than does canvas, so that there is quicker communication of vibration to an absorption by the hidden invisible shock absorbing fluid than is the case with a casing made of woven canvas. All of these virtues are postulated upon the theory that all the doubtful "ifs" previously mentioned, are eliminated. Sometimes they are, sometimes they are not, which is why cord tires sometimes outwear canvas tires and sometimes they do not. So that each type still has its advocates, though the cord is rapidly growing in popularity. It is the writer's belief that eventually it will displace the fabric tire, but this belief is not yet universally shared."

From the day of the practical application of the pneumatic tire to vehicular use, I have realized that it would not attain its full measure of excellence, that the full benefit and enjoyment of the principle would not be secured until the imprisoning outer shoe had more nearly approximated the lively resilience of that which it imprisons, viz; the real but hidden pneumatic tire of compressed air.

Every necessary form of imprisonment is an actual interruption of spontaneous communication to the core of compressed air which is the real pneumatic tire. In the above paragraphs in indicating the defects of existing types, I referred by inference to the ideal pneumatic tire free from such defects, although when the article was written, I had not seen it.

An Improved Cord Tire

Since then I have seen it, and it is the cord tire produced by the Dickinson Automatic Cord Tire Making Machine. This tire is, to my way of thinking, as nearly ideal as pneumatic tires will ever be made, and I am not making such a sweeping statement lightly or ill-advisedly.

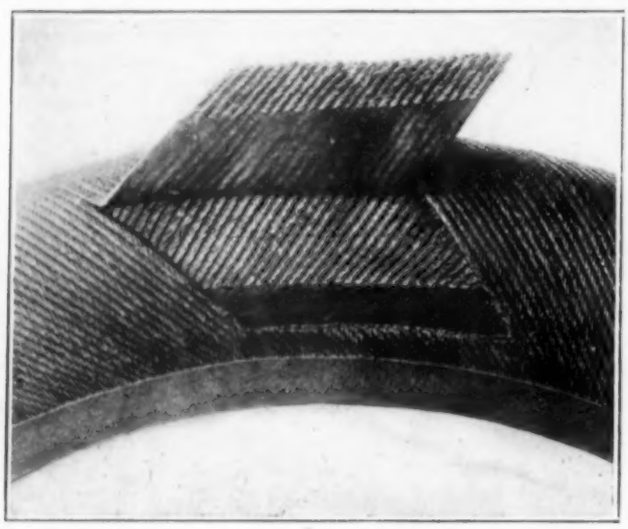
The inventor of the machine, Mr. Dickinson, commenced his experience with the pneumatic tire in the same year in which I commenced mine, viz; 1891. Evidently we have both aimed for the same objective of maximum resiliency and flexibility of the imprisoning shoe or outer casing combined with maximum economy and durability. Our ideals have been identical and the only slight difference between us is that Mr. Dickinson has done the thing, while I have simply wished that it might be done.

The Dickinson machine has reduced to precise mechanical and mathematical accuracy and economy the process of building the shoe or carcass of the pneumatic tire. This process heretofore has been wasteful, and consequently costly, but because there has been such a demand for maximum production of pneumatic tires, sufficient attention has not been given either to the attaining of the ideal pneumatic tire or of the reduction of its cost to bring it into line from an economical standpoint with other articles of rubber and cotton.

There is no such thing ultimately as "good enough". Sooner or later human nature demands the best obtainable and then finds fault because it is not better, and presumably this is as it should be. The main inherent defects of the pneumatic tire whether of woven canvas or laid cord construction are:—

1. The interference by chafing contact of one thread of cotton with another which sets up frictional heat and results in eventual distintegration of the fibre.

2. The distortion of the mathematically correct angles at



SHOWING HOW THE CORDS CROSS AT CORRECT ANGLES

which cords of cotton fibre should be laid so that each individual cord should sustain its exact proportionate share of flexing strain and tension pull in service.

If one thread is loose and wavy, that thread is doing no work, it is useless. If one thread is more taut than another, that thread is doing excessive work. It is under excessive strain to start with, and will quickly break in service. If one thread crosses or overlaps another without the protecting coating or insulation of rubber to prevent rubbing contact of fibre with fibre, the fibre will grind away as though it were held against an emery wheel. This is exactly what eventually happens to all pneumatic tires as now made. The cord tire as now made is more free from these defects than is the woven canvas tire, but neither are completely free.

The Waste of Cotton

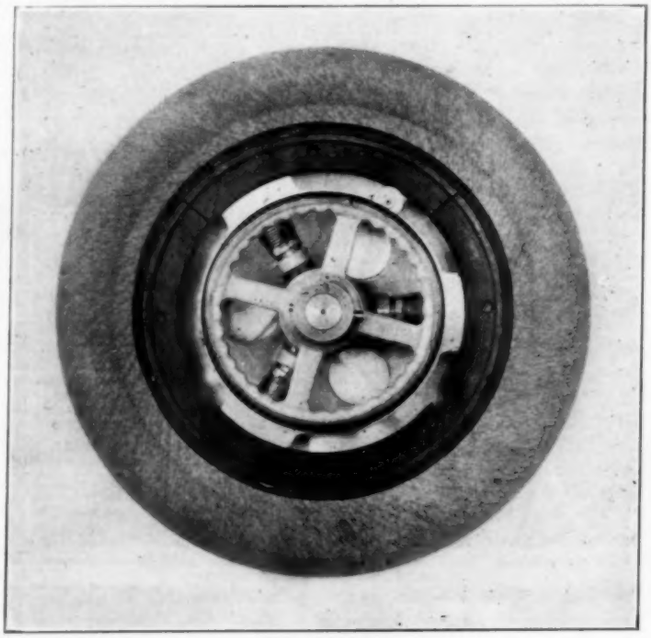
The under structure (the skeleton) of the tire should not wear out until all the fibre strength is exhausted, whereas in every pneumatic tire condemned to the scrap heap, the greater part of the cotton fibre is in excellent condition, good for much more service, but lost, because only some few parts here and there have failed from one or both of the causes mentioned, and as cotton is the most expensive material which enters into a pneumatic tire, here is partly accounted for the principal item of material cost per mile of service, viz; the waste of expensive cotton. The perfect tire should be so balanced in all its parts that it will not go to pieces until each part is worn out, and then suddenly retire like "the Deacon's One-Hoss Shay," in a puff of dust.

Now, if it were possible to positively prevent chafing contact of one thread with another by means of mathematically correct spacing and separation, by perfect rubber insulation within and around each cord to secure perfect angular alignment and tension of each individual cord, it is obvious that much of this waste of expensive cotton would be eliminated and that pneumatic tires would render much greater service.

What the New Machine Does

The Dickinson Automatic Cord Tire making Machine does it. It is "un fait accompli". It does more—not only does the machine overcome the two inherent defects in service mentioned, but it eliminates material waste in construction. Over 90 per cent of cord tires as now made are not truly cord tires, i. e. made of separate warp threads only, with no binding or weft or filling threads. The cord fabric as received by the tire manufacturer consists of warp threads running lengthwise of a roll of fabric, held together by widely spaced, loosely woven, very light weft threads, the object of which is to provide the tire manufacturer with a web of material in roll form which he can handle with his rubber coating and bias cutting machinery, and which can later be handled in the form of rubber coated strips by the tire builder, each strip being of such width as to form a ply with sufficient allowance for trimming. There is considerable waste in the rubber coating (calendering) operation. The material is very flimsy, it folds and wrinkles easily, and notwithstanding the most careful handling, it is not possible to prevent more or less waste from such folds or wrinkles, particularly in the starting of the roll of fabric through the machine. At the bias cutting machine there is unavoidable waste in cutting the angle at each end of the roll, and considerable waste frequently occurs from too great adhesion of the liner fabric which displaces or distorts by removal some of the warp threads, so that the tire builder is supposed to reject such distorted pieces when they reach him. Sometimes he does, sometimes he does not. Then the width of the bias strips must be such as to permit ample margin for trimming on the part of the tire builder. At the bias cutting machine and during the tire building process much waste is caused by careless handling of the rubber coatedfabric. If it becomes stuck together from any cause its place is usually the scrap box, as in attempting to pull it apart the light filling threads are very apt to break and a tangled mess results. Waste from all such causes is easily from 10 per cent to 20 per cent and more in some shops.

The use of cord tires of such fabric as described does not permit of perfect rubber insulation because the frictioning process is really only surface coating and filling the interstices. The rubber *is not thoroughly forced between the overlaps of warp and filling threads, at these points there is only imperfect rubber insulation if any at all.* With this fabric it is not possible to secure mathematically perfect spacing and alignment of the warp threads, because the interweaving of warp and weft or filling threads produce a waviness of line to start with, which remains wavy. Technically this is termed the

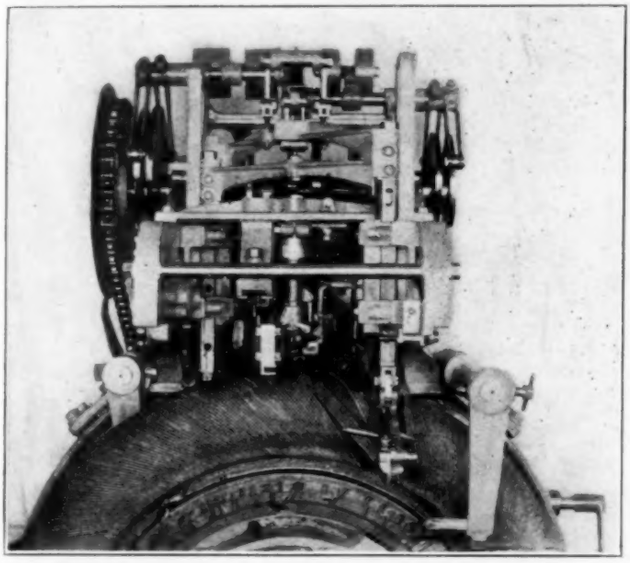


THE FINISHED CARCASS

crimp of the weave, and the desideratum in a tire is a cord as taut and straight and true as a fiddle string. Where there is crimp there must be eventual elongation—something to be absolutely avoided in the ideal tire.

It is not possible with this fabric to apply such tension to each ply and to each cord in the process of building a tire that each cord will describe (as it should) a perfectly taut straight line at a true angle without distortion or waviness from edge to edge or from bead to bead of the tire.

The tire builder must stretch the strip over the crown of the core upon which the tire is built, and must full in the edges. Here is unavoidable distortion of cords by the use of such fabric and because of such inherent weak spots more plies are used than would be required if each cord in each ply could function perfectly, each one sustaining its exact proportional share of strain, the object being to provide sufficient plies to offset any existing defect in any one ply. Hence much more rubber coated cotton is used than is required for internal pressure and external load, merely to offset inherent structural weakness, and in securing this object (aside from the wastefulness of using these extra plies) the added thickness of the wall leads to added flexing strain, chafing and consequent generation of heat in service resulting eventually in premature ruptures and blowout.



THE DICKINSON MACHINE IN OPERATION

Filling Threads Cause Chafing

Although the weak, openly spaced filling threads or weft of the present cord fabric are designed to break in service and set free the warp threads (the cords proper) to flex and function independently, they do not always break, and even when they do, they still remain embedded in the carcass, and they set up much more chafing and interfere much more with the resiliency of the tire and its consequent life than is generally realized.

Whether or not these filling threads break they cause the dangerous see-sawing action previously referred to, and it is at the points where these threads cross that the carcass of the tire invariably gives way finally. It is also astonishing how much more power is required to drive the car on account of these interfering filling threads than when they are absent. Just as the present cord tire is more resilient, longer-lived and uses less power than a tire of square woven canvas, so is a true cord tire as made by the Dickinson machine with no filling threads, broken or unbroken, with each cord doing its full work, more resilient, longer lived, and uses less power than the cord tire made of such fabrics as described.

The present cord tire may be aptly termed a step toward the perfect tire.

How the Machine Operates

The machine draws five or more rubber impregnated cords from spools, placed on a circular frame, through guides under exact weight tension, to other guides and a die which flatten them into a tape. Still under absolutely equal tension this tape by continuous mechanism is spread so that that part which is laid immediately over the crown of the core (immediately under the tread of the tire) is wider than those parts of the tape which are laid on the smaller diameters of the core. See illustration.

Automatic fingers grip the tape, and a guide throws it to the requisite angle immediately prior to laying it over the core. While gripped under tension, as though stretched by two hands, an automatic knife cuts the tape to the exact length required. There is not a particle of waste. The core revolves at such intermittent speed as to bring each successive strip of corded tape exactly edge to edge. When a complete revolution of the core is effected the cords meet with absolute precision. The revolving operation is then reversed so that the cords cross at right angles. It is claimed that this machine will produce twenty five carcasses per hour. It positively eliminates the personal equation, is automatic throughout, prevents all waste by the substitution of mechanical accuracy for hand work. It does away with all calendering, bias cutting, and booking of stock. The process also includes rubber impregnating small threads and twisting and cabling them after rubber coating. The inventors claim to secure by this process a rubber deposit of 40 per cent as against the most heretofore obtained of 20 per cent to 22 per cent, a feature of very great importance.

In addition to the attainment of this extremely strengthening extra impregnation or insulation over anything heretofore attained, the Dickinson process includes a decided improvement by ingenious automatic mechanism of cable laying the seven separate strands of each cord so that perfect tension and pitch is secured. The result is proved by breaking test. 290 pounds is required to break one of the seven strand cords on a Scott machine operating at 12″ per minute, whereas cords of the same size and strength and number ends insulated and cabled by the best methods heretofore known break under exactly similar test conditions at 156 pounds. Here is a gain in strength of over 85 per cent, which gain applies to the entire carcass of the tire. The break of this improved cabled cord is as clean as tho' cut by a knife, against the usual frayed and ravelled break, showing irregular ends and consequent uneven pull in service. The figures prove that the Dickinson process secures every ounce of pull in service from each of the seven strands as one unit, as against a pull heretofore obtained of but about 54 per cent of the number of strands used, or in other words, whereas by the Dickinson process seven strands give the combined strength of seven strands, by the best process heretofore known such seven strands give but the combined strength of less than four strands.

Mr. Dickinson and his colleagues have spent over eight years in developing the machine. His patents have been sustained by the Court of Appeals. The company expects to have one hundred machines in operation in various factories in this country by the end of the year. The machines are not for sale but will be operated on a royalty basis per tire produced. Arrangements have been made for the use of the machines in foreign countries. It is a conservative prediction that cord tires made by this machine will cost much less than canvas tires as now made and will give easily double the service of cord tires as now made. The feature of standardization of factories and elimination of labor turnover with the consequent reduction of overhead expense will effect such a tremendous saving as to be truly revolutionary.

The Elimination of Air Bags

Heretofore it has not been deemed possible to build and vulcanize a cord tire on the same core, or in fact, to vulcanize a cord tire on a core at all (although this is the quickest and simplest method where possible) because it has not been considered possible to lay each ply of cord fabric on the building core at such tension as to prevent distortion, when the squeeze of the press is applied to the mold and tire in the vulcanizing process. Consequently the precarious use of the costly air bag has been resorted to almost, if not quite universally. The labor cost of removing the tire from the building core prior to vulcanizing is a considerable item. The extra floor space required for this extra operation is a big overhead expense and the uncertain life and maintenance of the air

bag itself (aside from its cost) is a source of constant anxiety and wastefulness. The air bag itself is a waste of expensive material (although heretofore regarded as unavoidable) and it can never be pre-determined when an airbag may give out and ruin a tire through loss of internal pressure during the vulcanizing process, or in other words, just how many seconds or rejected tires will result from its use.

The Dickinson method renders the use of the air bag obsolete, although those tire manufacturers who may doubt this very significant statement can— if they choose—use the Dickinson process of tire building and still continue the use of the air bag, but it is the writer's prediction that the air bag with all its costly drawbacks is doomed by the use of the Dickinson machine.

Mr. Dickinson has accomplished for tire building what machinery has accomplished in other industries. It is a very big achievement and reflects unusual credit upon the inventor for his exceptional ingenuity, patience and determination. The machine in operation may be seen by those interested at the factory of the Dickinson Cord Tire Corporation, 220 West 19th. Street, New York. It has been highly endorsed by the leading experts and engineers in the tire industry. A phrase employed in the Company's literature is "Revolutionizing an Industry".

Venezuelan Pendare -- a Rubber Substitute

By U. S. Vice Consul S. J. Fletcher,
La Guaira, Venezuela

THE "pendare," a tree of the eastern section of Venezuela, as yet unclassified, is similar in many respects to balata or purguo (mimusops globosa), and belongs to the latex-giving family of trees.

The tree is found in abundance in the mountains of Imataca; in the Federal Territory Delta-Amacure; in the Piacoa range, which is a branch of the Imataca range; and along the banks of the Barima and Amacuro Rivers. The territory now receiving the most extensive exploitation is a zone comprising part of the Piar District, state of Bolivar, and the El Toro and Curiapo Municipalities of the same state.

The latex of the tree, converted into "chicle" by coction, is today one of the principal natural products of exploitation of the state of Bolivar. The trees, which reach a height of 40 to 50 meters, are tapped after being felled, a practice disastrous to the future of the industry, but one which the government has been unable to prevent, despite the measures taken by the Ministerio de Fomento to conserve the trees. After extraction, the latex is boiled; and the solidified ball which results is known locally as a "plancha."

The gatherers often follow the poor practice of mixing the latex of the Balata with that of the pendare before boiling, thus diminishing the value of the product, which is classified at Ciudad Bilivar, the principal center of the trade. Frequently, also, a clay soil, abundant throughout the Municipality of Pedro Covo, state of Bolivar, is mixed with the pure product, with a resultant deterioration of the pendare. It is hoped that the measures adopted by the government will result in the production of a more uniform and pure product.

Contract Labor

The lack of laborers has brought its resultant problems to that distant section of the Republic. From necessity a fatal system of "avance" has been developed, which brings its consequent worries to the contractor, and makes his estimate of the cost of production a matter of pure chance. Each peon is advanced a sum varying from 300 to 400 bolivars (the bolivar at normal exchange is equal to $0.193) upon his departure from the forests, which amount he is to refund in deliveries of pendars. Quite often, however, the peon who has thus been advanced his working capital decamps, and goes in search of another contractor to defraud.

Throughout the region of the Piar District of the state of Bolivar and the Federal Territory of Delta-Amacuro, the product brings an average of 60 bolivars for 46 kilograms. The freight to the points of exportation, usually El Palmar and Upata, of the state of Bolivar, and Curiapo, of the Delta-Amacuro, is more or less 20 bolivars for 46 kilograms. From Upata to San Felix (from whence it is sent down to Ciudad Bolivar) the freight is 4 bolivars for 46 kilograms. From Curiapo the freight is from two to three bolivars.

The largest contractor paid his gatherers the sum of 170 bolivars per 46 kilograms, including national and state taxes of 40 bolivars, for the first 9 months of the calendar year 1921. Since that time the price has fallen to 150 bolivars. A large American firm has offered to pay 55 cents a pound for the entire Venezuelan production, c.i.f. New York. The freight from Ciudad Bolivar to New York is $10 for 46 kilograms.

Permits for Exploitation

The permits for the exploitation of the natural product are obtained by means of contracts with the Ministerio de Fomento, for periods of five years, in zones limited to 50,000 hectares, or simple permits for 1,250 hectares, for periods of one year. The contractor has the option to prolong the period should he so desire. According to the Year Book of the Ministerio de Fomento for 1921, there are some ten contracts made with the government for the exploitation of balata and similar products. Foreigners enjoy equally with the Venezuelans the privilege of exploitation of the natural products of Venezuela, under conditions stated in the Regulations for the Exploitation of Natural Products, decree of February 8, 1922. However, the industry is not recommended to those inexperienced in work of such a nature in the tropics.

The dry seasons, which may be of varying lengths, are best suited to the collection of pendare. In the region of exploitation there exists two rainy seasons, the first from May to August inclusive, and the second, the "Northers," from December to February or March. Unexpected rains and an early beginning of the rainy seasons are often, however, the cause of loss of much time and money to the contractors.

Hard Rubber Substitute from Corn Cobs

A recent report from Washington states that research work by chemists of the Department of Agriculture, which has extended over a period of more than six years, has finally resulted in the production from corn cobs of a large variety of crude commodities including a low-priced substitute for hard rubber. Results of the experiments were announced through the American Chemical Society by Dr. W. W. Skinner, assistant chief of the Bureau of Chemistry. Dr. Frederic B. LaForge and Gerald H. Mains of the Bureau are also due credit for their experiments in this direction.

The achievement consists, it is said, in the perfection of methods for the production of a chemical compound known as "furfural" from corn cobs at a low price. This new compound is said to have been tried successfully for a great number of purposes, chief among them, as far as the trade is concerned, as a substitute for hard rubber.

The compound is made by placing the cobs and water in a pressure cooker exerting a steam pressure of 135 pounds. After cooking for two hours the furufural is blown off with steam, passed through a condenser and collected as an aqueous solution. This solution is then distilled in a special apparatus and the compound drawn off.

It is said that plans are now under way for the erection of a commercial plant for the utilization of the new process. The plant will be built at some point in the corn belt where the raw materials are close at hand.

NEWS OF THE INDUSTRY

Interstate Commerce Commission Grants Lower Scrap Rubber Rate

The decision of the Interstate Commerce Commission regarding freight rates of scrap rubber has at last been made public. The National Association of Waste Material Dealers, Inc., asked that scrap rubber and scrap rubber tires be rated as 6th class instead of 5th in carload lots in the Official Classification territory.

Railroads fought the case bitterly but to the gratification of the National Association of Waste Material Dealers and many firms engaged in the scrap rubber trade, the contentions of the association were upheld. The final decision was in line with the tentative report issued by the examiner who heard the case.

The Commission requires the carriers to maintain and apply to the transportation of scrap rubber, including tires, in carloads, of value only for reclaiming purposes, a rating not in excess of 6th class. The order is to be put into effect not later than Aug. 26, 1922.

It is hoped that this change in the freight classification in addition to the 10 per cent reduction in rates will do much to revive better conditions in the scrap rubber trade.

To Hold Rubber Exposition in Brussels

Under the patronage of the King and with the official recognition of the Belgian Government, the sixth international exhibition of rubber, other tropical products, and allied industries is slated to be held in Brussels in April, 1924.

The exposition will be held at the same time as the Fifth Commercial Fair of Brussels, which is organized by the city under the presidency of the Burgomaster and the Chief Sheriff, and is to be under the official auspices of the fair. The exposition will take place in the Hall of Cinquantenaire which is in Cinquantenaire Park where the fair will be held.

Sir Owen Philipps has consented to continue in office as the honorary president of the exposition, Prof. Wyndham R. Dunstan, director of the Imperial Institute as honorary vice president and Sir Ernest Birch as honorary chairman of committees.

Goodyear Gives Wage Increases

P. W. Litchfield, vice president and factory manager of the Goodyear Tire & Rubber Co., Akron, Ohio, recently announced an increase in wages averaging between five and six per cent granted to the workers in all departments. In two departments—the engineering and flying squadron—an increase of 7½ per cent was given. No corresponding increase in the salaries of office employes was made.

Mr. Litchfield declared that neither profits, which were on a very narrow margin, nor increases in the cost of living justified an increase at this time; it was simply being made to meet conditions which existed in Akron alone.

He said that the outlook was for a heavy demand for tires to continue until the end of August. It would then taper off until October when the plants would be able to stabilize at lower production levels, perhaps 75 per cent of the present output.

Spartan Rubber Co. Organized

The interests which recently took over the Yardville, N. J. plant of the defunct Zee Zee Rubber Company filed articles of incorporation under the laws of New Jersey on June 20. The new firm will be called the Spartan Rubber Company and will manufacture high grade tires and tubes to be known as Spartan Armor Tread cord tires and Spartan tubes.

Officers of the new company, all of whom are New York City business men, are as follows; Arthur Newman, president; Edward D. Newman, vice president and secretary; and Stanley Newman, treasurer.

The work of making the changes necessary for capacity production has already started at the plant. From the day it opens it will be operated day and night with either two ten-hour shifts or three eight-hour shifts. A force of about 200 hands will be hired to work under Carl Kavenagh, now production manager of the factory of the Ajax Rubber Company, who is to be plant superintendent.

Purchase of the Zee Zee plant was made at an auction sale on May 26 for the sum of $58,000. Harry Klag, Jr., receiver for the Zee Zee Rubber Company, received the final payment June 20.

Electric Hose & Rubber Co. Operating Day and Night

Production at the Electric Hose & Rubber Co., Wilmington, Del. is now on a larger scale than at any time since the end of the war, according to officials. Both a day and night shift are striving to keep pace with the volume of sales. Officials say that even on a 24-hour basis difficulty is being experienced in supplying promptly the demand for their products

Rubber Store Buys New Home

E. A. Quiri & Son, a firm conducting a wholesale and retail rubber business at Schenectady, N. Y. have bought the property of M. A. Carbonelli, 25 West Main street. The present building will be demolished and a new one erected on the site which will be used by the Quiri firm as its headquarters.

Whitehead Bros. Rubber Co. Building Plant Addition

A two-story brick addition to the plant of the Whitehead Bros. Rubber Co. at Trenton, N. J. for the manufacture of hose is now under construction. The main plant of the Whitehead company is said to be not only the oldest rubber factories in Trenton but one of the oldest industrial structures in the entire state of New Jersey.

A paper mill originally occupied the site of the present stone structure which is located a little over a mile northeast of Trenton in Hamilton township. John Whitehead and his six sons acquired this mill and equipped it for the manufacture of woolen goods. The mill was destroyed by fire in 1852; soon after the central portion of the present stone building was erected and the manufacture of woolens continued there until 1868 when the mill was converted into a rubber plant.

Since that time the company has continued the manufacture of rubber products; its reputation for quality and service extends over a period of 55 years.

Rubber Association of America Moves its Offices

On June 23 the Rubber Association of America, Inc. announced the removal of its offices from 52 Vanderbilt avenue to 250 West 57th street, New York City. The new offices are located in the building on the southwest corner of Broadway and 57th street.

N. Lincoln Greene to Manage Department for Clifton

The Clifton Manufacturing Company, Boston, Mass., manufacturers of backing cloth and shoe covering cloth, insole canvas, rubberized clothing, insulating tapes and compounds, etc. recently announced that beginning in the early fall its rubber clothing department will be under the direction of N. Lincoln Greene as general manager. Mr. Greene is well-known in this branch of the industry.

J. B. Phillips Joins Sales Force of A. Daigger & Co.

A. Daigger & Co., 54 W. Kinzie Street, Ill., importers of many chemicals and colors used in the compounding of rubber, announce that they have added J. B. Phillips to their sales force. Mr. Phillips will handle the sales of the oxide colors in the West.

A. Daigger & Co. are the sole representatives and distributors for the Lookout Manufacturing Co., makers of high grade oxide colors. The increasing inquiries for these colors has necessitated the addition of another salesman.

Rubber Chemistry Fellowships Awarded at Akron University

Professor H. E. Simmons, head of the department of chemistry at the Municipal University of Akron announced recently that the two fellowships in rubber chemistry for the coming year have been awarded to Garrett H. Barnes, Jr., and Jelks Barksdale.

Mr. Barnes, who was graduated from the Massachusetts Institute of Technology with a B.S. degree in chemical engineering at the commencement exercises last month, is twenty-five years old. After completing his fellowship at the Municipal University, he will devote at least

GARRETT H. BARNES, JR.

a year of his time in the services of the Goodyear Tire & Rubber Co.

Jelkes Barksdale was graduated from the University of Alabama located at University, Ala., last May with a B.S. degree in chemical engineering. Upon completing his studies in the chemistry of rubber at the Municipal University he will devote his time to the Firestone Tire & Rubber Co.

Both men were highly recommended for the fellowships by their respective universities.

Overproduction of Tires is Opinion of H. S. Firestone

Harvey S. Firestone, president of the Firestone Tire & Rubber Co., Akron, Ohio, on June 9 expressed the opinion that there is danger of an overproduction of tires in the United States. In fact, he claims the surplus exists at the present time in many sizes, although a great many of these tires will probably be sold by the end of this month.

In an interview published in an Akron newspaper, Mr. Firestone is quoted, "Our information shows us that there is a large overproduction of tires now in many types and sizes. In fact, demand all along the line has hardly kept pace with the production and as a consequence a surplus has been piling up.

"It is expected that the usual increase in trade sales during the coming month will absorb this surplus and I hope this will enable the rubber industry to maintain its present production schedule late into the year. From a general business viewpoint there is reason for optimism but we must view the improvement sensibly and proceed with caution."

The daily production of tires in Akron is estimated at 85,000 tires a day; it is expected that there will be no decrease for some time, due to the influx of summer orders.

William G. Grieb Dead

William G. Grieb, founder of the old Grieb Rubber Co. of Trenton, N. J., died suddenly at his home, Scarsdale, N. Y., June 14.

In early life Mr. Grieb was associated with the boot and shoe industry; later he became the senior member of the firm of J. G. Grieb & Sons, Philadelphia, Pa. In 1908 he organized the Grieb Rubber Co. at Trenton. This firm later became consolidated with the Ajax Rubber Co. under the name of the Ajax-Grieb Rubber Co. After serving as the president of this firm from 1910 he retired from active business in 1918. Since his retirement the company has been known as the Ajax Rubber Co.

Mr. Grieb was affiliated with Howard Lodge No. 35, F. & A. M. of New York and the Union League of Philadelphia. He was a life member of the New York Athletic Club, Scarsdale Golf Club and the Seaview Golf Club at Atlantic City. He was recently elected mayor of Longport, N. J., where he had a summer home.

Besides his widow Mr. Grieb is survived by six children.

Firm Organized to Make Hard Rubber Substitute from Kelp

Even in these days of cheap rubber, various plans are constantly being put forward for the manufacture and distribution of rubber substitutes. From Bath, Maine, comes the news that the Hamosax Manufacturing Co. recently filed papers of incorporation at Augusta with the avowed intention of finding a site along the Maine coast where a plant may be erected for the manufacture from seaweed and kelp of a substitute for hard rubber.

The papers name the capital as $200,000, of which half is preferred and half common stock. Ten shares with a par value of $100 have already been subscribed and $1000 paid in. The incorporators of the company are Hayden T. Hawthorne, president; Dunlap Hateh; Charles D. Hall and John J. Keegan.

It is understood that the company has patents and that sufficient experimenting has been done to prove to the satisfaction of those interested that the plan is feasible. Mr. Hawthorne has been considering factory sites in the vicinity of Boothbay Harbor and Rockland.

Tropical Ranch & Rubber Co. Sues to Recover $68,000

The Tropical Ranch & Rubber Co., St. Paul, Minn. on June 7 began civil action in the United States district court at St. Paul against Irving A. Caswell, Winn Powers and executors of the Ambrose Guiterman estate to recover $68,000 alleged to be due them. In the complaint it is said that because of gross mismanagement on the part of the defendants, acting as the board of directors of the company, the Tropical firm had been injured in its financial credit and reputation to the amount of damages sought.

JELKS BARKSDALE

Early Transactions of Tuscora Being Investigated

The grand jury in Tuscarawas county, Ohio, has begun an investigation of the alleged irregularities in the organization and early transactions of the Tuscora Tire & Rubber Co. of New Philadelphia, Ohio. There has been much litigation involved in the receivership of this company, which failed March 1, following, it is said, the sale of over a million dollars worth of stock. The grand jury investigation will center around the acts of two of the officers and promoters of the company.

William F. Nank Joins the Mason Tire & Rubber Co.

William F. Nank, who has acted in various capacities with the B. F. Goodrich Company, Akron, Ohio; the Ideal Tire Company, Cleveland; and the Erie Tire & Rubber Co., Sandusky; has joined the Mason Tire & Rubber Co. of Kent, Ohio, as manager of its branch at Indianapolis, Ind. Mr. Nank will spend several weeks at the main offices at Kent studying the branch policies and products of the company before leaving for Indianapolis.

The June Meeting of the Mid-West Association

The regular monthly meeting and luncheon of the Mid-West Rubber Manufacturers' Association was held at the Hotel Morrison on June 13, 1922 with a large attendance. The meeting was presided over by president W. W. Wuchter, and called to order at 3 p. m.

Following the luncheon a number of manufacturers present expressed their views of the tire industry in the future. One manufacturer suggested that the members consider the possibilities of co-operative selling of tires similar to the cooperative selling organizations among the farmers, which will enable them to compete with the larger houses. Those present generally were optimistic and predicted a large volume of tire sales to the consumer in the near future, and reported operations at the present time at good capacity.

Fabric men present, stated that in view of the strong position on cotton, there is more confidence in cotton fabrics than for some time and every one considers fabrics at today's prices a good investment; they also stated that tire manufacturers are busier now than in the past, and predicted that if the popularity of cord tires continues to grow, there will soon be twice as many cord as square woven fabric tires made.

The principal speaker at the luncheon was Frank T. Bentley, traffic manager of the Illinois Steel Company who spoke on "Transportation". He predicted that with the revival of business in the fall, there would again be a car shortage as in 1920 and again the motor trucks would come into their own. Mr. Bentley questioned whether the proposed Great Lakes St. Lawrence Waterway would be of great benefit to the Middle West and the nation as a whole, pointing out that Montreal is closed from four to five months out of the year and navigation from Montreal is dangerous because of fogs and icebergs. He also pointed to the high insurance rate, the lack of coal at Montreal and the inability of the steamers passing through the lakes to carry big cargoes. He said the waterway would probably be built, although he was doubtful whether enough business would result to warrant the project.

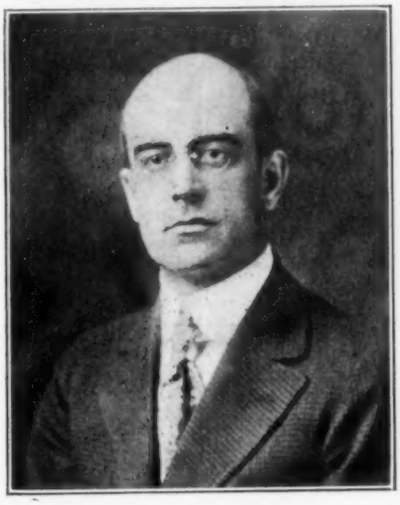
We are just starting to build good roads in this country, said Mr. Bentley in emphasizing that transportation is in its infancy, although far ahead of any other land. In maintaining that the American people are speed maniacs, he pointed out that in previous years merchants from Montreal and other points would come to Chicago twice a year to buy merchandise, whereas now they buy small lots frequently and turn their capital oftener. He declared that the development of transportation in the years to come means a big future for the motor truck.

O. C. Diehl,of the Dow Chemical Company, Midland, Michigan, attended the luncheon as a guest of J. Tumpeer, of the Wishnick-Tumpeer Chemical Company, Chicago, and gave a short talk on material used in rubber compounding and the production of such material at their plant.

Due to the fact, that tire manufacturers are busy at this time and also the warm weather, the July meeting will be postponed. The next meeting will be held on the second Tuesday in August 1922.

Goodyear Promotes A. G. Cameron

A. G. Cameron, who has just been appointed manager of the export company of the Goodyear Tire and Rubber Co. has



A. G. Cameron

been with Goodyear just a little under ten years.

A native of Indiana, Mr. Cameron entered business early in life, and has had wide experience in sales and executive work with the domestic company, for whom he was successively manager of the Dallas and St. Louis branches.

He later entered the export field, where he was manager of the Australasian division for several years, and finally became export sales manager, which position he held at the time of his present appointment.

Amazon Trebles Output

Officials of The Amazon Rubber Co., Akron, Ohio, announce that production is now running 85 per cent of the total capacity of the plant, and orders are in hand to such an extent that it is imperative to increase production to total capacity immediately.

American Tire & Rubber Co. Announces New Tire

A new cord tire was recently placed on the market, announces the American Tire & Rubber Co., Akron. The new tires, which are known as the American-Akron cords, will sell from 20 to 25 per cent lower, according to officials. Production at the American plant is now said to be at capacity with a daily output of 750 tires a day.

President Harding Approves "Republic Rubber Week"

The following letter has been received from the White House by the Republic Rubber Co., Youngstown, Ohio:

"White House, June 7

"Yours of June 5th to the President enclosing copy of the statement by Mayor Oles of Youngstown is before me. In behalf of the President I have to thank you for informing him of this interesting and very suggestive movement in Youngstown of which he heartily approves.

Very sincerely,

GEORGE B. CHRISTIAN, Jr.,
Secretary to the President."

The letter to which the President referred was issued on June 5 by Mayor George L. Oles of Youngstown, advocating a "Republic Rubber Week."

The company recently announced changes in personnel as follows: R. W. Kent, formerly manager of the plant at Canton, has been placed in charge of both the Canton and Youngstown factories. C. O. Tice has been named superintendent of the manufacture of tires in both plants; and E. W. Henry has been appointed office manager at the Canton plant.

Mason Tire & Rubber Co. Makes Offer for Plant at Bedford

The Mason Tire & Rubber Co., Kent, Ohio, has made an offer for the plant of the Owen Tire & Rubber Co. at Bedford, Ohio, according to a recent announcement. The affairs of the Owen company are now in the federal bankruptcy court.

It was stated that Charles Higley, trustee in bankruptcy, had passed upon the offer and would recommend it to the referee, Carl D. Friedolin for acceptance. Formal application to sell the plant is to be made shortly.

The purchase price was not divulged. Before the deal can be consummated it will have to be approved both by the creditors and stockholders of the company, who have suffered heavy losses by the failure, but it is believed that a majority favor the transfer.

According to the schedules filed in court, appraisers appointed by the state court, fixed a value of $465,071 on the assets of the company, including the plant, which is valued at $155,000 and the power house, which was appraised at $27,240.

Goodyear Registers Two Brands of Belting at Patent Office

The Goodyear Tire & Rubber Co., Akron, Ohio, recently announced that it had registered with the patent office at Washington the names of two brands of rubber belting: "Rhino" and "Hippo". Rhino, which is a friction belt, is intended for use on small pulleys moving at high speed. Hippo is also the trade name of a friction belt which is manufactured for agricultural uses.

Program for Rubber Section of Safety Conference Announced

The National Safety Council announces that its annual conference will be held at the new Cass Technical High School, Detroit, Mich., Aug. 28 to 31. A program of unusual interest has been mapped out for the four days. The program of the Rubber Section of the Council will occupy the second and third days of the conference.

While the conference is in session the headquarters of the Rubber Section will be in the Hotel Statler.

RUBBER SECTION PROGRAM
Chairman, H. T. Martin,
The Fisk Rubber Co., Chicopee Falls, Mass.
Vice-Chairman, C. F. Horan,
Hood Rubber Co., Watertown, Mass.
Secretary, E. W. Beck,
U. S. Rubber Co., New York City.

FIRST SESSION
Tuesday Morning, August 29,—9:30 o'clock.
Report of Secretary
Reports of Committees:
(a) Membership Committee
E. L. Hewitt, U. S. Rubber Co., Footwear Division
New Haven, Conn.
(b) Bulletin Committee
E. A. Hoener, Firestone Tire & Rubber Co., Akron, Ohio.
(c) Safe Practices Committee
E. H. Fitzgerald, Federal Rubber Co., Cudahy, Wis.
Address by A. L. Rose, Service Director, Kelly-Springfield Tire Co., Cumberland, Md.
Subject—"Trials and Compensations of the Safety Man."
Discussion
Address by G. W. Cook, Supervising Inspector, Worcester, Mass.
Division, Travelers Insurance Co.
Subject—"Vulcanizers"
Discussion
General Round Table Discussion:
Safety Committee—H. F. Keating, U. S. Rubber Co. Morgan & Wright Plant, Detroit, Mich.
(a) Value
(b) Types
(c) Functions
(d) Experiences Encountered in Organizing
Appointment of Nominating Committee.

SECOND SESSION
Wednesday Morning, Aug. 30—9:30 o'clock
Reports of Committee: (Continued)
(e) Standardization & Statistics
E. W. Beck, U. S. Rubber Co., New York City.
Discussion
(f) Health Hazards Committee
C. F. Horan, Hood Rubber Co., Watertown, Mass.
Discussion
Address
Speaker—Dr. W. S. Ash, U. S. Rubber Co., Morgan & Wright Plant, Detroit, Mich.
Subject—"Aims and Ideals of the Plant Physician".
Discussion
Address
Speaker—Myron H. Clark, General Factory Manager, Footwear & Misc.
Factories, U. S. Rubber Co., New York City.
Subject—Management & Safety
Discussion
Address
Speaker—M. A. Marquette, Production Supt., The Fisk Rubber Co., Chicopee Falls, Mass.
Subject—"Production with Safety."
Discussion
Report of Nominating Committee

Goodyear Mechanical Goods Salesmen Convene at Akron

A country-wide conference of mechanical goods salesmen and Goodyear technical men was held recently at the home office of the Goodyear Tire and Rubber Company, Inc., at Akron, Ohio.

Reports of steady improvement in business conditions over the country were brought in by the sales representatives. They were addressed by various company officials and production executives and were taken through the factory while they were in Akron.

A dinner at the University Club wound up the conference.

D. R. Burr, manager of mechanical goods sales, L. C. Rockhill, general sales manager, and President E. G. Wilmer were among the speakers.

Mr. Burr made the following statement on conditions in mechanical rubber goods: "The mechanical goods business all over the country is showing signs of betterment. There is no better indication of the gradual comeback of industrials in general, and also of the recognition by the leading industrials that only the most modern systems are conductive to successful plant operation in this present highly competitive period, than the fact that installations of Goodyear conveyor belts with the special feature of assistance and service from our G. T. M. corps, are increasing daily and point to our having a gratifying share of this business. The same is true of transmission belts."

Studebaker-Wulff Rubber Co. Puts on Night Shift

Due to an increasing demand for their product, the Studebaker-Wulff Rubber Company, Marion, Ohio, recently put on a night shift. B. F. Wulff, general manager of the company, stated that this action was made necessary by the prompt sale of all tires manufactured each day; hence the company has not been able to form a surplus stock. According to Mr. Wulff, production will be increased until the capacity of the plant has been reached.

Firestone Gives Office Men Increase in Salaries

Following a recent increase in the wages of factory employes, the Firestone Tire & Rubber Co., Akron, Ohio, has announced an increase of 10 per cent in the salaries paid to office workers. The Firestone company was the first Akron rubber firm to readjust wages.

"Albalith" Output Again Increased

Arrangements have just been completed by The New Jersey Zinc Company for another substantial increase in the output of "Albalith". This will give the company plant capacity sufficient to meet the requirements of lithopone consumers for some time to come.

Since "Albalith" was placed on the market commercially, less than two years ago, the demand for it became so large that an increase in capacity was found necessary on two different occasions. Each addition, however, proved inadequate due to the greater consumption by those using it and to the fact that the number of consumers is now larger than ever before.

"Albalith" is a brilliantly white light resisting lithopone. After a series of exhaustive tests it was introduced in the summer of 1920 and has since been consumed in rapidly increasing tonnages.

Hudson Tire & Rubber Corp. to Begin Production Soon

Officials of the Hudson Tire & Rubber Corp., Yonkers, N. Y. state that production at their new plant will soon begin. Heavy duty mills and calenders for the Hudson plant have been built and will be installed by the Allen Machine Co., Erie, Pa.; two great vulcanizers, one tube vulcanizer and the hydraulic equipment will soon be installed by the Southwark Foundry & Machine Co., Philadelphia, Pa. Electric equipment has been manufactured by the General Electric Company of Schenectady, N. Y., the steam generating plant by the Erie City Iron Works, Erie, Pa. and the tire building and machines were made by the Akron Rubber Mold & Machine Co., Akron, Ohio.

Some of this equipment has been made especially for the Hudson corporation, including several machines which are practically automatic in operation that have been designed to eliminate many unessential operations. It is said that the Osborn Engineering Company, Cleveland, Ohio, which has planned many of the tire factories throughout the country, has embodied in the Hudson plant all modern methods and devices.

The present unit of the plant has a capacity of 500 tires and tubes per 8-hour day which can be trebled by operating three shifts. Additional plans provide expansion for a production of 5,000 tires a day.

W. M. Doucett, president of the Hudson Tire & Rubber Corp., states that the company will start operations with a plant which has cost 35 per cent less than was originally estimated due to the fact that it did not buy equipment at peak prices.

H. B. Seymour is vice president and treasurer of the company. E. W. Stull, who has been identified with several rubber plants as factory manager, arrived in Yonkers on July 1 to assume charge of the factory.

It is stated that from the start of production the plant will be running at capacity due to its outlets for a great volume of tires.

Rubber Importers Fail

A voluntary petition in bankruptcy was filed June 13 by George H. Fearons, Jr., of the firm of Phelan, Borland & Fearons, importers of crude rubber, maintaining an office at 11 Moore Street, New York City. The petition gives the liabilities of the firm as $894,601 and the assets as $195,450.

L. Candee Plant Reopens

L. Candee & Co., the plant of which has been closed for the last two months or so, reopened with full forces on July 1. At the time of the temporary shutdown it was announced that the plant would resume as soon as the volume of orders warranted it. The firm is a subsidiary of the United States Rubber Co.

MARKETS

Cottons and Fabrics

NEW YORK, JULY 3, 1922

Weather was more particularly the determining factor of the course of cotton prices during the last two weeks; the weather reports and the cotton estimates together causing the wildest fluctuations of the season. At one time the local market for spot cotton advanced to 23.30 cents for middling upland; a figure not before quoted for many years. Prices fell violently upon a crop report by one important factor of a condition of 74.9 against 69.3 a month ago; an improvement of 5.6 per cent which was the largest gain for June in over 30 years with the single exception of 1920. The report gave the increased acreage as 9 per cent and the indicated crop as 11,674,000 bales. Another prominent house puts the condition as 70.9 with an indicated crop of only 10,900,000 bales. This last figure is not very satisfying in view of an estimated minimum consumption of 12,500,000 bales. The government figures of consumption for May showed a total of 495,675 bales used in domestic mills; 48,731 bales more than in April. For the ten months of the cotton year the total is 4,945,492 bales, over 900,000 more than in the corresponding period last year; and this big increase with a million fewer spindles operating than last year owing to the New England strike. Cotton spinning activity showed a slight increase in May as compared with April. The Census Bureau report shows that there were 32,502,674 spindles operated as compared with 30,921,094 in April.

A World Cotton Survey

Secretary Hoover of the Department of Commerce has approved of a bill introduced by Senator Harris of Georgia to make a world survey of cotton on hand on September 1, December 1 and March 1 of each year. It is intended to collect all possible statistics on the amount of carry-over cotton of all grades at these three periods during the year. The foreign data would be gathered by the Bureau of Foreign and Domestic Commerce and the figures on domestic cotton would be compiled by the Census Bureau. The bill is in the hands of the Committee on Commerce as a substitute for the original Harris bill which only called for a census of cotton on hand in the United States.

EGYPTIAN COTTON

Reports from Alexandria announce an active market with a good demand for both Sakel and Uppers; particularly the low and medium grade Sakels. Low grades are very scarce and there is not much hope of large supplies of these staples arriving from the interior until the new crop is harvested. The prospects for the new crop would be very promising were it not for the danger of a shortage of water during July. The weather however has continued relatively cool which helps somewhat to counteract the damaging effect of a scarcity of water on the young plants.

Another Cotton Wrangle

A dispute has arisen between the Alexandria Produce Association, representing the largest exporters of Egyptian cotton for the Liverpool lines, regarding the freight rate for cotton to England. The dispute involves the American Shipping Board whose price last year of 25 shillings a ton was accepted this year by the Produce Association but owing to the dispute with the Liverpool lines the Produce Association has not as yet signed with the American Board's representatives at Alexandria. The Produce Association insists that last year's freight rate of 25 shillings a ton shall be reduced to 15 shillings.

EXTRA STAPLE COTTON

The market was firm but inactive. Extra staple cotton, strict middling in grade and color were quoted as follows; 1 3/8 inch, 32 to 33½ cents; 1 3/16 inch, 35 to 37 cents; 1¼ inch, 38 to 41 cents; 1 5/16 inch, 42 to 44 cents.

Egyptian uppers, medium brought 28 to 30 cents; high grade Sak, 50 to 54 cents.

Sea Island, extra choice, was in good demand at 48 to 52 cents.

Carded Peeler Now in Demand

The most noticeable feature of the tire fabric market was the big increase in the demand for carded peeler builders of grades selling from 47 to 50 cents. It was reported that there had been a sale of 300,000 pounds of this low grade fabric at about these prices. All through the season the demand has been for carded fabrics with a preference for the lower grades a condition quite the reverse of that which prevailed a few years ago at which time only combed fabric was in demand by tire manufacturers. The heavy buying during the last two weeks can be accounted for in part to the fear of a tie up following the railroad strike.

CORD FABRICS

Combed Sakellarides	lb.	.84 @	—
Carded Sakellarides	lb.	.73 @	—
Combed Peeler	lb.	.70½ @	.75½
Carded Peeler	lb.	.57 @	.59
Combed Egyptian uppers	lb.	.71 @	.73½
Carded Egyptian uppers	lb.	.66½ @	.68½

SQUARE WOVEN

17¼-ounce Egyptian uppers, combed	lb.	.66 @	.68½
17¼-ounce Egyptian uppers, carded	lb.	.61½ @	.63½
17¼-ounce Sakellarides, combed	lb.	.75 @	.79
17¼-ounce Sakellarides, carded	lb.	.68 @	.71
17¼-ounce Peeler, combed,	lb.	.65½ @	.69
17¼-ounce Peeler, carded	lb.	.52 @	.54

SHEETINGS—DUCKS—BURLAPS

Sheetings—The market has been quiet with prices slightly higher. There was some interest in 40 inch, 2.85 yard at 11⅞ cents net. 9 cents net was asked for 40 inch, 4.25 yard; 10 cents net quoted on 40 inch, 3.75 yard, and 14 to 14¼ cents net for 40 inch, 2.50 yard.

Ducks—There was good demand for ducks and prices of all items ranged higher. For single filling 18½ at 19½ cents was asked and 19½ at 20½ cents for double filling, price varying according to the grade; enameling, 41 at 47 cents a pound depending on width and make; belting and hose were quoted at 39 at 42 cents a pound.

Burlaps—The dock strike is still in progress in Calcutta and both buyers and sellers of burlap are waiting definite news as to the situation there. Shipments to this country in the past 5 months have averaged 85,000,000 yards monthly; or from 15,000,000 to 20,000,000 yards more monthly than the pre-war normal.

SHEETINGS

40-inch 2.50-yard	yd.	.14 @	.14¼
40-inch 2.85-yard	yd.	.12 @	.12¼
40-inch 3.15-yard	yd.	.13½ @	—
40-inch 3.60-yard	yd.	.10¾ @	.11
40-inch 3.75-yard	yd.	.10 @	—
40-inch 4.25-yard	yd.	.09 @	—

DUCKS

Belting	lb.	.39 @	.42
Hose	lb.	.39 @	.42
Enameling	lb.	.41 @	.47
Shoe Ducks	lb.	.45 @	—
Single filling	lb.	.18½ @	.19½
Double filling	lb.	.19½ @	.20½

BURLAPS
(Carload Lots)

8 -ounce 40-inch	100 yds.	6.25 @	6.35
7½-ounce 40-inch		6.20 @	6.25
10 -ounce 40-inch		9.35 @	9.50
10½-ounce 40-inch		9.00 @	9.75

DRILLS

37-inch 3.25-yard	yd.	.11½ @	—
37-inch 2.75-yard	yd.	.13 @	—
37-inch 3.00-yard	yd.	.12 @	—
37-inch 3.50-yard	yd.	.10¾ @	—
37-inch 3.95-yard	yd.	.10 @	—

OSNABURGS

30-inch 7-ounce		.13 @	—
40-inch 7-ounce		.13 @	—

Chemicals and Compounding Ingredients

THE INDUSTRIAL CHEMICAL MARKET, JULY 3, 1922—Trading in industrial chemicals during the past two weeks was only moderately active. Prices were steady but trading was limited to small lots and there did not seem to be any keen desire to buy even for a few months ahead. Despite the marked lack of demand for large lots the volume of business was sufficient to hold values in a steady position. It is believed that the tariff situation is having a bad effect on the market. Imported goods continued to arrive in fair quantities but not in sufficient volume to affect prices here. The past month has been quite up to June levels in its volume of business.

ACCELERATORS

Organic

Aldehyde ammonia, crystals	lb.	$ .95 @	.98
Aniline oil, bulk basis,	lb.	.14 @	.15
Excellerex,	lb.	.40 @	.45
Formaldehyde-Aniline	lb.	.50 @	—
Hexamethylene-tetramine (powdered)	lb.	.67 @	.75
Paraphenylenetramine	lb.	1.60 @	1.70
Thiocarbanilide	lb.	.38 @	.40
Vulcocene	lb.	.35 @	—

Inorganic

Lead, dry red bbls.	lb.	.08¾ @	.10
Lead, white, basic carbonate	lb.	.07 @	.07¾
Litharge, domestic	lb.	.08½ @	.08¾
imported	lb.	.17 @	—
Lime, Superfine	lb.	.02¼ @	.02½
Magnesia, calcined, light,	lb.	.24 @	.25
extra light	lb.	.45 @	—
heavy	lb.	.05½ @	.06
Orange Mineral	lb.	.12 @	.14

COLORS

Blacks

Carbon Black	lb.	.16 @	.20
Micronex	lb.	.17 @	.24
Lamp Black	lb.	.12 @	.40
Bone "	lb.	.05½ @	.07½
Drop "	lb.	.07½ @	.16
Ivory "	lb.	.15 @	.45

Blues

Prussian	lb.	.55 @	.60
Ultramarine	lb.	.08 @	.35
Cobalt	lb.	.21 @	.25

Browns

Iron oxide	lb.	.05 @	.06
Sienna, Italian, raw and burnt	lb.	.05½ @	.14
Umber, Turkey, raw and burnt	lb.	.04 @	—

Greens

Chrome, light, c. p.	lb.	.30 @	.32
medium	lb.	.35 @	.36
dark	lb.	.36 @	.45
commercial	lb.	.12 @	—
Rubber Makers Green	lb.	3.50 @	—

Reds

Antimony, crimson	lb.	.21 @	.24
golden	lb.	.20 @	.44
red sulphuret	lb.	.20 @	.22
Indian, English, pare	lb.	.12 @	.15
Para toner	cwt.	1.25 @	1.40
Rubber makers red	lb.	3.50 @	—
purple	lb.	2.50 @	—
Toluidine tone	lb.	2.10 @	—
Tuscan red	lb.	.17½ @	.35
Venetian red	lb.	.03½ @	.06
Vermillion, quicksilver, English	lb.	.90 @	.95
domestic	lb.	.25 @	.30

Whites

Albalith	lb.	.06 @	.06½
Aluminum bronze	lb.	.55 @	.60
Azolith	lb.	.06 @	.06½
Lithopone, domestic (factory)	lb.	.06¼ @	.06½
Zinc oxide. American Horse Head Special	lb.	.08 @	.08½
XX red	lb.	.07½ @	.08
American Azo: ZZZ (lead free)	lb.	.07½ @	.08
ZZ (under 5 per cent leaded)	lb.	.07¼ @	.07¾
Z (8-10 per cent leaded)		.07 @	.07½
Zinc oxide, French process, White seal	lb.	.12½ @	—
Green seal	lb.	.10 @	.10½
Red seal	lb.	.08¾ @	.09¼

Yellows

Cadmium sulphide	lb.	1.60 @	1.70
Chrome, light, c. p.	lb.	.16½ @	.17
dark	lb.	.16½ @	.17
medium	lb.	.16½ @	.17
Ocher, French	lb.	.03 @	.04½
domestic	lb.	.02½ @	.03
Rubber Makers' Yellow,	lb.	3.50 @	—

COMPOUNDING INGREDIENTS

Aluminum flake	ton	25.00 @	29.50
hydrate	lb.	.17 @	.18
Ammonia carbonate,	lb.	.08¾ @	.09¾
Barium carbonate	ton	60.00 @	62.00
Barytes, southern off-color,	ton	.15 @	.17
Western, prime white,	ton	23.00 @	—
Basofor	lb.	.04¾ @	—
Blanc fixe, dry, f.o.b. works	lb.	.04¼ @	.04½
Chalk, precipitated, extra light	lb.	.03 @	.03¾
heavy	lb.	.02½ @	.03¼
Clay, China, domestic,	ton	15.00 @	16.50
imported	ton	16.00 @	22.00
Dixie	ton	22.00 @	32.00
Blue Ridge	ton	22.00 @	32.00
Fuller's Earth, powdered	ton	23.00 @	25.00
Fossil flour	ton	60.00 @	—
Glues, extra white	lb.	.30 @	.40
medium white	lb.	.20 @	.26
cabinet	lb.	.18 @	.30
cabinet low grade	lb.	.15 @	.18
common bone	lb.	.08½ @	.14
Graphite flake, bbls.	lb.	.06½ @	.12
powdered	lb.	.04 @	.10
Infusorial earth, powdered	ton	60.00 @	—
bolted	ton	65.00 @	—
Mica, powdered	lb.	.10 @	—
Rotton Stone (powdered)	lb.	.02½ @	.04½
Silica (aluminum)	ton	22.00 @	23.00
Soapstone, powdered	ton	12.00 @	—
Starch, powdered corn	cwt.	2.22 @	2.50
Talc, domestic	ton	15.00 @	18.00
French	ton	22.50 @	30.00
French, high grade	ton	40.00 @	45.00
Italian,	ton	44.00 @	55.00
Terra Alba, American No. 1	cwt.	1.85 @	2.00
American No. 2	cwt.	1.25 @	—
Tripoli	lb.	.02½ @	—
Whiting, commercial	cwt.	1.10 @	—
Quaker	ton	13.00 @	15.00
English cliffstone	cwt.	1.70 @	1.90
gilder's bolted	cwt.	1.15 @	1.25
Paris white American	cwt.	1.35 @	1.45
Wood pulp XXX	ton	30.00 @	—
" " X	ton	25.00 @	—
Zinc Oxide— 5 per cent leaded		.07¼ @	.07¾
10 per cent lead sulphate	lb.	.07 @	.07½
20 per cent lead sulphate	lb.	.07 @	.07½
35 per cent lead sulphate	lb.	.07 @	.07½

(Also see whites)

MINERAL RUBBER

Gilsonite	ton	70.00 @	—
Genasco (factory)	ton	50.00 @	—
Hard hydrocarbon	ton	32.00 @	45.00
Soft hydrocarbon	ton	30.00 @	35.00
Pioneer M.R.	ton	42.00 @	44.00
320 M. P. hydrocarbon (c. l. factory)	ton	45.00 @	50.00
300/310 M. P. hydrocarbon (c. l. factory)	ton	40.00 @	45.00
Synpro, granulated, M.R. (factory)	ton	54.50 @	70.00

SOFTENERS

Acids

Acetic, 28 per cent	cwt.	2.25 @	2.50
Phenol	lb.	.12 @	.18
Cresylic, 97 p. c.	lb.	.56 @	.58
95 p. c.	lb.	.51 @	.53
Muriatic, 20 degrees	cwt.	1.10 @	1.25
Nitric, 36 degrees	cwt.	5.00 @	6.00
Sulphuric, 66 degrees	ton	16.00 @	17.00
60 degrees, bulk	ton	10.00 @	12.00
Tartaric, crystals	lb.	.30 @	—

Alkalies

Caustic soda, 76 p.c.	cwt.	3.75 @	3.90
Soda ash, 58 p.c.	cwt.	2.15 @	2.20

Oils

Castor, No. 3, bbls.	lb.	.11 @	—
Corn, crude, bbls.	lb.	.11 @	—
refined	lb.	.12½ @	—
Chinawood, bbls.	lb.	.13½ @	.13¾
Cottonseed,	lb.	.09¾ @	—
Glycerine, drums	lb.	.15 @	.16
Linseed, domestic	lb.	.86 @	—
imported	lb.	.78 @	.79
Palm, Niger		.06⅛ @	.06¼
Lagos	lb.	.07 @	.07¼
Peanut, domestic, crude	lb.	.12 @	.12¼
Pine, steam distilled over 930° sp. gr.	gal.	.90 @	—
Rapeseed, refined	gal.	.84 @	.85
blown	gal.	.95 @	1.00
Rosin, first rectified	gal.	.39 @	—
second rectified	gal.	.41 @	—
Tar, commercial	gal.	.31½ @	—
Soya Bean, crude, bbls.	lb.	.11¼ @	.11½
" " refined	lb.	.12 @	—

Resins and Pitches

Cumar resin, hard	lb.	.09 @	.12
Cumar resin, soft	lb.	.09 @	.12
Tar Retort	bbl.	9.00 @	—
kiln burned	bbl.	9.00 @	—
Pitch, Burgundy	lb.	.05 @	.06
coal tar	ton	.01½ @	—
pine tar		.03½ @	—
Rosin, grade K	bbl.	6.50 @	—
Strained	bbl.	6.00 @	—
Shellac, fine organe	lb.	.85 @	—

Solvents

Acetone, drums	lb.	.08½ @	.10
Alcohol, denatured, No. 1 bbls.	gal.	.32 @	.34
Methyl, 95 per cent, drums	gal.	.52 @	—
Benzol, 90 per cent	gal.	.27 @	.32
pure	gal.	.30 @	.35
Carbon bisulphide,	lb.	.06 @	.07
tetrachloride	lb.	.09½ @	.10½
Dimethylaniline	lb.	.35 @	—
Motor gasoline, steel bbls.	gal.	.24 @	—
Toluol, pure	gal.	.30 @	.35
Turpentine, spirits	gal.	1.48 @	—
wood	gal.	.78 @	.80
Xylol, pure	gal.	.45 @	.51
commercial	gal.	.34 @	.39

Waxes

Beeswax	lb.	.36 @	.38
sun bleached	lb.	.45 @	—
Caranuba, No. 1	lb.	.16 @	—
Ceresin, white	lb.	.09 @	.10
Bayberry	lb.	.20 @	.24
Montan, crude	lb.	.04 @	.05
Ozokerite, black,	lb.	.15 @	.17
Paraffine	lb.	.05 @	—
Petrolatum, amber, bbls.	lb.	.04½ @	—
dark amber,	lb.	.04 @	—

SUBSTITUTES

Black	lb.	.08½ @	.14
White	lb.	.09 @	.16
Brown	lb.	.10 @	.14
Brown factice	lb.	.08 @	.14½
White factice	lb.	.09 @	.15½

VULCANIZING INGREDIENTS

Lead, black hyposulphite (black hypo)	lb.	.42 @	—
Sulphur chloride (jugs)	lb.	.20 @	—
Sulphur flour pure	bbl.	2.60 @	3.10
Bergenport pure	cwt.	2.55 @	—
superfine, 99½ p.c.	bbl.	2.40 @	2.90

Aniline Oil—The market was extremely weak for a period and as low as 13 cents a pound was reported. Latterly the demand increased and 14 at 15 cents became the ruling quotation. There is an abundance of stocks.

Barytes—The demand continues good the market has been what manufacturers would call a satisfactory one. The price continues at 23 for Western material f.o.b., point of production.

Blanc Fixe—Supplies are light and there was little change in the tone of the market. Dry was quoted at 4¼ at 4½ cents per pound and pulp at $40 at $50 per ton.

Benzol—The demand continues very heavy but the supply has suffered no diminution as there has been increased production in anticipation of a continuance of the coal strike.

Carbon Bisulphide—Leading producers report an increased demand. Prices remained the same and the market was firm at 6 at 7 cent per pound.

Carbon Tetrachloride—Sales have been light with supplies in good volume. Prices have been rather weak at 9½ at 10½ cents per pound.

Carbon Black—The demand from the tire trade continues heavy. Prices have been steadily advancing for the past six months and in this comparatively short period have increased nearly 100 per cent. Latest quotations are 16 at 20 cents per pound.

Litharge—Prices continued the same with some improvement in the demand. Quotations were as follows: In casks, 8½ at 8¾ cents; 100 pound kegs, less than 500 pounds, 12½ cents; 500 to 2000 pounds, 11¼ cents.

Lithopone—Producers are kept busy to supply the demand in spite of the large quantity of foreign material that keeps coming in. Sales are being made for delivery up to September. Domestic quotations continue at 6 cents per pound in bags; 6¼ cents in barrels, car lots and 6½ cents less than car lots.

Orange Mineral—Prices for both domestic and foreign material remain unchanged. The market continues quiet. Domestic is quoted at 12 at 14 cents per pound; German at 14 cents and French at 15 cents.

Soda Ash—Trading was along routine lines and the demand was not particularly heavy. Producers quoted contracts at $1.10 in bulk. 48 per cent basis; $1.20 in bags; $1.40 in barrels.

Talc—A good demand continues for both foreign and domestic talc and stocks are not large. Domestic was quoted at $15 at $18 per ton; French, $22.50 at $30.00; high grade French, $40 at $50; Italian, $44 at $55.

Whiting—The demand continues to improve and stocks are not large. Prices remained unchanged. Quotations follow: Commercial, 1.10 per 100 pounds; gilders bolted, $1.15 at $1.25; American paris white, $1.35 at $1.45; English cliffstone $1.70 at $1.90.

Zinc Oxide—The demand from the tire and other rubber industries continues far in excess of last year. The volume of business done has been large but no changes have been made in prices. Quotations of domestic follow: French process, red seal, 8¾ at 9¼ cents; green seal, 10 at 10½ cents; white seal, 12½ cents.

Crude Rubber

NEW YORK, JUNE 30, 1922

There was a two-day flurry in the crude rubber market following the meeting on June 27, in Haarlem, Holland, of representatives of the Java planters. As a result of the cabled information that at this meeting the planters had decided to ask the Dutch government for assistance in establishing better prices on crude rubber, the New York market jumped overnight from 15¼ to 16½ cents, London was up from 7 5/8d. to 9 d., and the Colombo and Singapore markets made substantial gains. The higher prices in the local market attracted sellers in some volume, gradually forcing the quotations downward, but prices are still from ½ to ¾ of a cent on the average above those of a fortnight since.

This latest move on the part of the Dutch planters has been brought about by the action of the British planters in an effort to restrict production of crude rubber and raise the level of prices. There is a general feeling now that the Dutch government will appoint a committee to meet jointly with the committee appointed by the British colonial secretary with a view to bringing about either a curtailment of production on the plantations or a tax on overproduction. It is reported from London that the labor force on Eastern plantations is less than half of the normal requirements; production this year is estimated at 300,000 tons and consumption at 400,000, or a 100,000 ton decrease in stocks of crude rubber. If this statement is correct and the British and Dutch governments take official action to restrict production by either means suggested, it is safe to say that crude rubber prices from now on will show a firm tone and an upward trend.

Just now the local market has again become quiet with little demand from buyers and few offerings from sellers, but there is generally a more optimistic feeling all around and a steadier market with gradually better prices is anticipated. Paras are somewhat lower on the average. There is a slight demand for sheet Balatas and prices are firm.

Quotations of this date are practically as follows:

Plantations			
Ribbed Smoked Sheets and First Latex, spot	.15⅝	@	.15¾
July	.15⅝	@	.15¾
July/September	.15⅞	@	.16
July/December	.16⅛	@	.16¼
October/December	.16⅜	@	.16½
January/March	.16⅝	@	.17
Smoked sheets, plain, spot	.15	@	—
Amber Crepe No. 1	.15¼	@	.15½
" " " 2	.14½	@	.14¾
" " " 3	.14	@	.14¼
Light clean thin brown crepe	.14½	@	.14¾
Commercially clean thin brown crepe	.13¾	@	.14
Roll Brown crepe, spot	.12½	@	.12¾
Paras			
Madeira Fine	.23	@	.23½
Acre Fine	.18½	@	.18¾
Up-river Fine	.18¼	@	.18½
Up-river Medium	.17	@	.17½
Up-river Caucho ball (shipment)	.12½	@	.12¾
Up-river Coarse	.12½	@	.12¾
Islands Fine	.16½	@	.16¾
Islands Medium	.15¾	@	—
Islands Coarse	.08	@	.08½
Cameta	.09 9/10	@	.10
Xingu Ball	.10½	@	.10¾
Tapajos fine	.17	@	.17½
Pontianac			
Prime Pressed	.12	@	—
Plantation	.06½	@	.06¾
Bangermassin	.07¾	@	.08
Palembang	.08½	@	.09
Siak Gutta Percha	.15	@	.15½
Prime Macassar	2.75	@	2.80
Balata			
Panama Block	.35	@	—
Surinam Sheets	.68	@	.70
Columbia Block	.42	@	.45
Venezuela Block	.48	@	.50

Reclaimed Rubber

NEW YORK, JUNE 30, 1922

There has been little activity in the reclaimed rubber market during the past two weeks. The plants which operate in this branch of the industry are still on a part time basis, as orders from the usual buying sources are limited strictly to current needs. No material increase in demand for any of the grades is reported.

Quotations of this date are nominally as follows:

Standard Reclaims			
Floating	$.12	@	$.13
Friction	.12	@	.13
Boots and Shoes	.09¾	@	.10⅛
Boots and Shoes (washed)	.13	@	.14
Mechanical	.08	@	.10
Hose	.10½	@	.11¼
Tires, truck	.09	@	.10
Tires, auto	.09	@	.10
White	.13	@	.14

Scrap Rubber

NEW YORK, JUNE 30, 1922

The fact that crude rubber prices are in general somewhat higher than they were at the time of our last report does not seem to have affected the scrap rubber market and prices are off slightly on most of the grades. There is little demand even for the better grades of scrap and it is thought that prices are likely to fall to a lower level on some if not all of the grades. A few of the more optimistic traders look for better prices, but they are in the minority.

Quotations of this date (per pound in carload lots delivered) are as follows:

Auto tire peelings	.00¾	@	.01
Standard White auto	.00⅞	@	.01
Mixed auto	.00⅝	@	.00½
Bicycle tires	.00½	@	—
Clean solid truck tires	.00¾	@	.00⅞
Boots and shoes	.02¼	@	.02⅝
Arctics, trimmed	.01¼	@	.01⅜
Arctics, untrimmed	.00¾	@	.01
Inner tubes, No. 1	.03	@	—
Inner tubes, compounded	.02	@	.02¼
Battery jars, black compounded	.01	@	—
Inner tubes, red	.02⅝	@	.02⅞
Heels and pads	Nominal		
Black mixed	.00¼	@	.00⅝
Garden hose	.00½	@	—
Air brake hose	.00½	@	.00¾
Red packing	.01	@	.01¼
Red mixed rubber	.01¼	@	.01½
White mixed rubber	.01½	@	.01¾

American Rubber Patents

1,416,187 John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York. Tire Flap.

1,416,252 Herbert S. Blynt, Yale, Okla. Pneumatic Vehicle Tire.

1,416,253 John Bobek, Trevorton, Pa. Pneumatic Vehicle Tire.

1,416,049 Edward J. Moran, Chicago, Ill. Punctureproof Tire.

1,415,994 George M. Collins, Sprague, Wash. Vehicle Tire.

1,416,303 Waldemar C. Peck, Naugatuck, Conn. Vehicle Tire.

1,416,362 Henry M. Lambert, Portland, Ore., assignor to Lambert Tire & Rubber Co., Akron, Ohio., a corporation of Arizona. Mold for Pneumatic Tires.

1,415,929 Oliver Grosvenor, Akron, Ohio. Method of and Apparatus for Continuous Vulcanizing.

1,417,275 John W. Meyers, Elyria, Ohio. Reversible Interchangeable Rubber Heel.

1,417,311 Henry L. Flesher, Riley, Ind. Pneumatic or Cushion Vehicle Wheel.

1,417,180 Walter Kline, Chillicothe, Ohio, assignor to The Kline Engineerng Co., Chillicothe, Ohio. Method and Apparatus for Manufacturing Tires.

1,416,873 George William Ray, Atlantic City, N.J. Automobile and Motor-cycle Tire.

1,417,051 Abraham L. Freedlander and William George Goodwin, Dayton, Ohio, assignors to The Dayton Rubber Mfg. Co., Dayton, Ohio. Rubber Tire.

1,417,383 Orson J. Humphrey, Elyria, Ohio. Pneumatic-Tire Tube.

1,416,917 Herbert N. Wayne, Washington, D.C. Inner Liner for Automatic Tires.

1,417,168 William A. Harris, Greenville, S. C., assignor to Harris Accessory Co., Greenville S. C. Low-Pressure Alarm for Pneumatic Tires.

Trade Marks Applied For

[The following are trade-mark applications pertinent to our field pending in the United States Patent Office which have been passed for publication and are in line for early registration unless opposition is filed promptly. For further information address National Trade-Marks Company, Barrister Building, Washington, D. C. or Bush Building, 130 West 42 Street, New York, trade-mark specialists. As an additional service feature to its readers this Journal gladly offers to them an advance search free of charge on any mark they may contemplate adopting or registering.]

MCKONE MADE, within oval with pointed ends. No. 159,372. The McKone Tire & Rubber Company, Millersburg, O. For rubber tires for automobiles.

RUBBER-WELD—No. 142,034. Rubber-Weld Co., Boston, Mass. For repair outfits comprising patches of sheet rubber and adhesive material.

POCOTOP—No. 158,643. Pocono Rubber Cloth Company, Trenton, N. J. For Waterproofed fabrics and rubberized fabrics.

OAK-IDE—No. 141,925. The Republic Rubber Corporation, Youngstown, O. For shoe soles and heels made of rubber or of composition rubber.

LEVY & WEISS SHOE CO., with picture of an eye in center of circle and words The Right Idea House. No.—157,577. Levy & Weiss, Shoe Co., N. Y. City, For leather shoes, fabric shoes, rubber shoes, and combinations of the same.

WILCO—No. 157,199. The M. I. Wilcox Company, Toledo, O. For rubber, fabric, and leather belting.

FARRAN-OID DUAL FLEX—No. 159,019. Farran-Kinney Company, Chicago, Ill. For belts and belting made of a composition of rubber, cotton fabric, and cord for automobile and power transmission.

SERVICE, across lower part of disc, and figure of inverted "V" No. 157,656. Billstein-Feierman Co., Cleveland, Ohio. For elastics consisting of woven material in which rubber is incorporated, shoe laces.

PEARL—No.160,262. Schloss Manufacturing Co., San Fransisco, Calif. For fruit-jar rings.

AMAZON—across picture of Amazon river. No. 158,380. Cupples Company Manufacturers, St. Louis, Mo. For rubber jar rings.

CULP PLAN—No. 157,514. George K. Culp, Inc., Wilmington, Del., and N. Y. City, For Vehicle Tires Wholly or Partly of Rubber particularly solid tires and casings and inner tubes of pneumatic tires.

SIMPLEX—No. 155,368. Simplex Tire & Rubber Company, Chicago, Ill. For Pneumatic rubber tires.

New Incorporations

CALIFORNIA

Giant Rubber Products Co., to deal in rubber goods. $300,000. Principal office, Los Angeles, California.

CONNECTICUT

The Lane Rubber Co., Inc. $20,000. Incorporators: Clinton E. Lane, Richard E. Lane and George E. Hall.

DELAWARE

Marine Rubber Corp. $1,250,000. Delaware agent, Delaware Registration Trust Co.

Atlanta Tire & Rubber Co., to deal in tires, tubes and rubber products. $500,000. Agent, Franklin L. Mettler, Wilmington, Delaware. Principal office, Wilmington, Delaware.

Dupont Leather Goods, Inc., to manufacture and deal in rubberized leather. $50,000. M. Korn, president; R. Korn, secretary—Peabody, Massachusetts. Principal office, Peabody, Massachusetts.

Flexite No-Air Tire Co., to deal in "Flexite No-Air" tires. $500,000. Incorporators: T. L. Croteau, M. A. Bruce and C. H. Blaske—Wilmington, Delaware. Agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware.

FLORIDA

Osceola Motor Co., to deal in tires. $25,000. I. P. Timmons, president; M. P. Ragsdale, vice president; S. G. Ragsdale, secretary. Principal office, Kissimmee, Florida.

J. M. Wolfe & Co., to deal in tires. $2,500. J. M. Festerman, president; C. Z. Osborne, vice president; J. M. Wolfe, secretary. Principal office, Umatilla, Florida.

The William A. Estaver Co., to deal in tires. $100,000. W. A. Estaver, president; N. R. Estaver, vice president and G. W. Estaver, Secretary—Jacksonville, Florida. Principal office, Jacksonville, Florida.

The Link Tire Co., to deal in tires. $30,000. Incorporators: W. R. Thacher, E. G. Link, W. R. Link—Orlando, Florida. Principal office, Orange and Central avenue, Florida.

ILLINOIS

Works Tire & Rubber Co., to buy and sell tires, tubes, etc. $50,000. Incorporators: W. J. Mogilicki, W. F. Talaczynski, J. Suchon and J. P. Drish—Chicago, Illinois. Principal office, 2017 South Michigan avenue, Chicago, Illinois.

KENTUCKY

The Ray Winter Tire Co., to sell tires and tubes. $10,000. R. Winters, president; R. H. Jones, vice president; C. C. Covington, treasurer. Principal office, Paducah, Kentucky.

MASSACHUSETTS

Rubwood Inc. $800,000. Incorporators: Harry N. Atwood, Boston, Mass.; Frank K. Broadhurst, Smithfield, N. C. and Frank M. Andrew and T. Edwin Andrew, Methuen, Massachusetts.

MISSOURI

Missouri Tire Co., to distribute Oldfield tires. $10,000. Incorporators: B. J. Fitzsimmons, president; J. A. W. Sumner, secretary and treasurer. Principal office, 3118 Locust street, St. Louis, Missouri.

NEW JERSEY

Farrell Rubber Manufacturing Co., to buy and deal in all kinds of crude and manufactured rubber. $100,000. Incorporators: T. A., J. L. and A. E. Farrell—East Rutherford, New Jersey. Principal office, East Rutherford, New Jersey.

Resilient Tire Co., to deal in tires. $250,000. Incorporators: B. G. Erler, Oak Lane, Pennsylvania; T. J. Davidson, 209 Arch street, Camden, New Jersey; J. Richter, 316 East 86th street, New York City. Principal office, Camden, New Jersey. Agent in charge, F. G. Homan.

NEW YORK

Staten Island Truck Tire Co., to manufacture tires. $20,000. Incorporators: W. McDonald and J. M. Searle. Attorney, E. Bernstein.

McKone Tire and Rubber Co., to manufacture tires. Incorporators: C. W. Reynolds, A. McEvoy, I. D. Neustern. Attorneys, Cherurg & Cherurg.

Blu-Devil Puncture Stop of New York, Inc., to deal in tires. $4,000. Incorporators: C. Giovinco, S. Brucin and J. Tornabe—Brooklyn, N. Y. Principal office, Brooklyn, N. Y.

Ideal Elastic Braid Co., Inc., to manufacture and deal in elastic braids. $3,500. Incorporators: B. B. Kasselbraner, R. Kasselbraner—449 East 137th street, New York City; H. H. Myers, 64 Vermilyea avenue, New York City.

Long Wear Tire & Rubber Co., to manufacture tires. $500. Incorporators: B. A. Daly, T. F. McMahon and B. G. Elliott—1400 Broadway, New York City.

OHIO

Excel Tire & Rubber Co., to manufacture rubber products of all kinds. 5,000 shares of common stock, no par and $500,000 of preferred stock. Incorporators: F. F. Falk, E. J. Brouse, Z. N. Wallis. Principal office, Wadsworth, Ohio.

Hubbel Rubber Co., to manufacture all kinds of rubber products. 1000 shares no par value. Incorporators: C. C. Hubbel, G. E. Hammond and C. J. Hoyt. Principal office, Newton Falls, Ohio.

Richland Rubber Co., to manufacture rubber tires, tubes etc. $1,000. Incorporators: C. Hoffman, G. W. Stephens, P. H. Ober and J. E. La Dow. Principal office, Mansfield, Ohio.

The E. C. Shaw Co., to manufacture and deal in rubber making devices. $15,000. Incorporators: E. C. Shaw, F. W. Weber, and C. A. Grome. Principal office, Cincinnati, Ohio.

Union Service Co., to deal in tires and tubes. $50,000. Incorporators: W. C. Seran, G. W. Scott, C. R. Bodan and F. B. Melchoir. Principal office, Canton, Ohio.

Roxana Tire & Rubber Co., to manufacture tires and tubes. $10,000. Incorporators: J. E. McCormack, C. W. Justice, George D. Moore, W. P. Trosper and E. W. Baker. Principal office, Akron, Ohio.

The Huntsberry Co., to deal in tires. $100,000. Incorporators: H. H. Huntsberry, C. M. Meyers, C. Blattert and G. McLammont. Principal office, Akron, Ohio.

Knox Tire & Rubber Co., to manufacture rubber goods. $400,000. Incorporators: H. M. Lybarger, G. H. Jones, M. G. Knoblock and G. Ball. Principal office, Mt. Vernon, Ohio.

The A. C. Rubber Co., to manufacture rubber heels. $10,000. Incorporators: W. R. Huntington, J. W. Dewhurst, F. A. Stetson, M. G. Welder, J. A. Ebert, A. T. Glew, A. F. Kwiss, R. D. Hurd and S. M. Dewhurst. Principal office, Elyria, Ohio.

OREGON

Medford Tire Co., to buy and sell tires. $5000. Incorporators: L. D. Jones, E. J. Jones and B. F. Lindas. Principal office, Medford, Oregon.

TEXAS

United & Globe Rubber Co. of Texas, to distribute United & Globe Rubber products. $10,000. R. H. Moers, president; K. C. Barkley, vice president; H. B. Schlesinger, treasurer and general manager. Principal office, 704 Franklin avenue, Houston, Texas.

WISCONSIN

Elvers & Rhode, to deal in tires. $15,000. H. C. Elvers, president and G. Elvers, vice president—717 South Dickensen street, Madison, Wisconsin; A. R. Rhode, secretary and treasurer, 1220 W. Johnson street, Madison, Wisconsin. Principal office, Madison, Wisconsin.

Name Change

Tru-Matic Tube Co., to Air-Matic Tube Co. of Pennsylvania.

Designations

Goodyear Tire and Rubber Exports Co. $10,000. Representative, M. Orr, 280 Broadway, New York City.

Capital Increases

Allen Tire & Rubber Co., Allentown, Pa. $1,000,000 to $2,500,000.

The Connecticut Hard Rubber Co. of New Haven, $10,000 to $50,000.